cinnati, Hamilton & Dayton was topheavy enough in 1910 to make it a source of danger to the Baltimore & Ohio, and the floods which washed out stretches of the line added greatly to the burden of high fixed charges. The Cincinnati, Hamilton & Dayton went into the hands of receivers and the Baltimore & Ohio took a loss on its books of $10,892,000. The Baltimore & Ohio property, itself, needed tremendously costly addition and betterment expenditures, and the state of the railroad bond market made it so difficult to do permanent financing that a $40,000,000 note issue was resorted to. This fell due in the midst of the European war, but the company managed to refund it with $60,000,000 5 per cent bonds. In the years 1914 and 1917, the company failed to earn its full common dividends but they were made up from surplus. Much of the Baltimore & Ohio stock is owned by conservative investors of the class who own New York, New Haven & Hartford stock. These investors are, in many cases, dependent for their living on their income from investments. To such as these the passing of the Baltimore & Ohio common dividend comes as a blow. Unlike the New Haven case, the blow cannot be attributed to ambitious or mistaken policies of expansion except in regard to the loss through the Cincinati, Hamilton & Dayton purchase and guarantee. This, of itself, would not have been fatal, and since 1910 the history of the Baltimore & Ohio, in regard to financing, has been an open story of a hard struggle against circumstances which have proved irresistible.

A Commission Expert on Railroad Troubles

The *Railway Age* has long contended that the railroad troubles of the country, and especially the decline of railroad expansion, which has been the immediate cause of many of our worst railroad troubles, have been due chiefly to the fact that the regulating authorities have steadily refused to permit the railways as a whole to earn adequate revenues. Support for this view has come from an unexpected but highly expert source. We publish elsewhere in this issue a letter from W. J. Meyers, formerly statistician of the Interstate Commerce Commission. Mr. Meyers was in charge of the Division of Statistics of the Interstate Commerce Commission during the years 1910-1915, inclusive. It was principally during these years, according to our contention, that the decisions of the Interstate Commerce Commission and the state commissions reducing or preventing advances in rates caused the decline in net operating income and the railroad bankruptcies, which, in turn, caused the decline of railroad development. No other man living knows as well as Mr. Meyers what the statistics of the railways, as compiled for the Commission showed during that period; and the opening sentence of Mr. Meyers' letter to the *Railway Age* is, "According to my view of the matter the fundamental cause of the difficulties in which our railway system is now involved is to be found in inadequate revenues." Elsewhere Mr. Meyers says: "The Act to Regulate Commerce declares that all rates charged by railways shall be just and reasonable, . . . but . . . it contains little to guide an administrative commission in determining what constitutes a just and reasonable rate, and the Interstate Commerce Commission, lacking statutory guidance in this regard, has been largely influenced by the dicta in the Supreme Court's opinion in Smythe vs. Ames, a case brought for the prevention of confiscation. It thus has happened that the action of the Commission in disposing of rate cases brought before it has frequently resulted in rates too low to produce the amounts of revenue necessary for efficient operation and development of the railways." This is exactly the contention of the *Railway Age* and the basis of our argument in favor of Congress adopting a clear statutory rule requiring that rates shall be so regulated as to be not only non-discriminatory but sufficient to yield the railways revenues adequate for efficient operation and for needed development.

A Service Record Worth While

No better proof of the value of timber preservation can be offered than the experience of the Southern Pacific in the removal of its wharf on the Oakland shore of San Francisco harbor, described on another page, where 67 per cent of the piling were found in such good condition after 29 years' service in a harbor infested with marine borers, that they are being redriven in other structures. It is only at intervals that records such as this are available. The Southern Pacific has therefore performed a real service in taking advantage of this opportunity to ascertain the actual resistance which the timber in this structure offered to decay and to the attacks of the teredo and limmoria. That the results of this examination are so satisfactory is a source of gratification to advocates of timber preservation. Repeating as this does in large measure the results obtained when the structure crossing Galveston Bay was dismantled a few years ago, it goes far to demonstrate the service which may reasonably be expected from sound timber properly seasoned and treated. With the railways rapidly passing from the earlier period of temporary pioneer construction to that of more permanent structures, knowledge such as is furnished by service tests of this character is of the greatest value to the engineer as a guide in the selection of the materials which will best meet the conditions to which the structures he builds will be exposed.

Why Not Provide for Adequate Revenues?

THERE IS REAL DANGER that private management of railways will not be successful after the roads are returned to their owners, because many leading members of Congress do not appreciate the necessity for making the specific requirement that rates must be made adequate and for providing for such administration of the regulatory laws as will give effect to this requirement.

The shipping and traveling public is as strongly in favor of the return of the railways to private operation as are railway owners and officers. But while the railway owners and officers and many business men want the legislation now under consideration to provide that rates must be made adequate to enable the railways to raise sufficient capital and are opposed to giving to Interstate Commerce Commission exclusive and supreme regulatory authority, some influential shippers are opposed to specifically providing that rates must be made adequate and are in favor of not only leaving the Interstate Commerce Commission all the authority it has, but of greatly increasing its authority.

Doubtless this is a natural division of opinion, but if it continues to exist it may wreck all plans for better regulation, render successful private operation impossible, and finally make government ownership unavoidable.

Those who oppose providing by law that rates must be made sufficient to enable the railways adequately to develop their facilities, and favor giving practically unlimited discretionary authority over interstate rates to the Interstate Commerce Commission, seem to have forgotten the history of railroad regulation in the United States before the war, or to overlook the fact that the conditions under which our former policy of regulation was adopted and the conditions which now exist are widely different.

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The old policy of regulation was made effective by legislation adopted in the years 1906 to 1910. For some time before that the general tendency of railway profits had been upward, and the legislation enacted then was predicated on the assumption that one of the main purposes of regulation should be to prevent the carriers from making too much money. Therefore the law provided that the Interstate Commerce Commission should fix only *maximum* reasonable rates, and later, the burden of proving the need for any advance in rates was put upon the railways. Most of the men then and since appointed to the Commission favored administering the law in the spirit in which Congress enacted it. The result, as we pointed out in an editorial in our issue for June 20, was that in the years 1910 to 1915 the percentage of net operating income earned by the railways steadily declined and the new investment made by them declined every year between 1911 and 1916, except 1914, being in 1916 less than one-third of what it was in 1911.

And what is the situation today? Are the railways earning a large and increasing net operating income? On the contrary, after eighteen months of government operation, they are earning at the rate of about 1½ per cent upon the investment. In other words, on the basis of present earnings and expenses, they are bankrupt. Therefore, whatever may have seemed desirable ten or fifteen years ago, it is certain that the thing the public welfare demands today is that the regulatory legislation, and the administration of it, shall be so changed as to permit a large increase of railway net operating income. Some people propose that instead of the rates being made adequate to enable the companies, after private operation is resumed, to earn sufficient profits the government guarantees shall be temporarily continued. But to continue the guarantees will be to leave the future of the railroads in the same uncertainty as now, and as long as that uncertainty exists there will be no substantial revival of the expansion of railroad facilities.

The history of railway regulation during the eleven years before this country entered the war, the conditions which now exist, and statements which recently have emanated from certain members of the Interstate Commerce Commission, constitute an unanswerable argument against giving the Interstate Commerce Commission practically unlimited discretion to determine the standard according to which railway rates shall be regulated in future. The Commission persistently refused, while acting under existing laws, to let the railways earn adequate net returns. That the attitude of some of its members is still anything but encouraging is shown by recent utterances of Commissioners McChord and Woolley. Commissioner McChord has attempted in the teeth of conclusive evidence to the contrary, to show that the Commission did let the railways earn adequate returns. Commissioner Woolley, who is a new member, has argued in a recent public address that rates should not even be advanced enough to prevent the railways from incurring deficits which must be paid from taxes. While it is well known that Commissioner Woolley and his colleagues differ wisely about some important matters, we know of no reasons for questioning that Commissioner McChord expressed the views of most of his colleagues. If a majority of the Commission does not today recognize the fact that the policy of regulating rates which prevailed before the adoption of government control was mistaken and harmful, there is no ground for hoping that without some new and definite instructions from Congress it would regulate them fairly and in the public interest in the future.

The *Railway Age* did not advocate the proposal for the creation of a Secretary of Transportation because it doubted if there was a good chance of its adoption and because it questioned the expediency of giving political government officer such authority over the railways as was proposed. We hoped the Commission, as a body, would make it so clear that it had learned much by the experience of recent years as to convince everybody there was no need of the creation of another body or official to which should be transferred some of its important functions. But recent utterances of Commissioners McChord and Woolley, tend powerfully to justify the feeling of mistrust regarding the Commission which the railway executives and many business and financial interests have manifested. The members of the Commission are intelligent, high-minded men. But practically all of them went upon the Commission either with very little knowledge of the railroad business or with a strong prejudice against the railway companies; in their official capacity they have dealt largely with the pathology of the railroad business; and, therefore, the information they have acquired in the work of regulation does not seem greatly to have increased their knowledge of railroading as a going industry or to have mitigated the hostile feeling toward the companies which some of them had when they were appointed.

In view of these facts the conclusion is unavoidable that the railroad problem cannot be solved by giving the Commission as at present constituted, practically unlimited discretionary authority over the regulation of rates and operation as is virtually proposed by the Esch-Pomerene bill. If the problem is to be solved, either Congress must give the Commission a specific mandate to so regulate rates as to enable the railway companies to raise sufficient capital adequately to develop their facilities, or it must delegate the determination of what return public expediency demands the railways shall be allowed to earn, to some other governmental official or board. If the Commission should regulate rates in the future as it regulated them in the past, the railroad industry would not and could not prosper, and the transportation facilities provided would not be sufficient to handle the commerce of the country.

Do not Congress and the public want rates so regulated as to enable the railway companies to provide adequate facilities and render good service? If they do want rates so regulated, why not definitely say so in the law? It could not do any harm to say so. It may do much harm not to say so.

Thoughts on Maintenance of Way

THE DIRECTOR GENERAL has thrown down the gauntlet to the corporate officers of the railroads insofar as the controversy regarding the adequate maintenance of the fixed properties of the railroads under federal control is concerned, by his recent repeated statements that the Railroad Administration has complied fully with its obligations in this respect. He has gone even further, and implied that the government has exceeded its obligations so far that severe retrenchment is necessary. This position is in such marked contrast with the belief of maintenance engineers connected both with the Administration and the railway corporations as expressed to the *Railway Age* that it demands careful attention.

Maintenance of way expenditures may be divided roughly into two general classes: those incidental to the routine repair and upkeep of the property, which are chargeable entirely to operating expenses, and those incidental to the replacement of the larger buildings or structures, which are chargeable entirely or only in part to operating expenses. The Railroad Administration has concentrated its attention largely on the former class of work, although, even as to this, as noted in previous issues, there have been relatively large deficiencies in the renewal of ties, rails and other basic materials. While better progress has been made this year than last, it is very questionable if the routine work of this

character can be brought up to a full compliance with the terms of the contract by the end of this year.

A more serious deficiency is to be found in the replacement of structures. Many units of railway property wear out, many others require replacement because they become obsolete or inadequate for the service required of them. These latter processes are continuous, and experience has demonstrated the necessity for the railways to make large expenditures for replacements from year to year if their properties are to be maintained in a way to meet the demands upon them. It is possible to postpone replacement work for short periods, but it must be undertaken with redoubled energy later in order to make up for the time which has been lost. The war-time conditions under which we were laboring last year made it necessary for the roads to postpone much work of this character. No criticism is to be attached to the Railroad Administration for this. Our problem then was to win the war and all work which could safely be postponed was properly postponed. As a result, the rebuilding of stations and other buildings not immediately necessary for the handling of traffic, the replacement of steel bridges with those of heavier design, and other similar work was almost entirely suspended. It is work of this character, with its relatively heavy maintenance charges which has been most seriously neglected, and must now be renewed. An investigation of expenditures for replacements in the test period, or in the longer period of ten years before government control was adopted, as has been suggested by some, will show that the roads have in the past spent tremendous sums for replacement work, which is chargeable to maintenance and is considered a part of the normal maintenance program. Any reasonable interpretation of the standard contract must include attention to expenditures of this character, for the fact that they were postponed as a war-time measure does not in any way constitute a release from the obligation to make them good now.

Another condition which must be considered before closing the books is the depletion of the stocks of material. When the government took over the roads on January 1, 1918, most of them had on hand their normal working supplies of ties, rails and other materials. The extreme difficulty of securing materials of all kinds last year made it necessary as a war measure to curtail purchases to the minimum and this resulted in seriously depleting stocks of all kinds. Since that time the financial limitations under which the Administration has been laboring have caused it to curtail purchases still further, with the result that the already depleted supplies on the various roads are being pooled to meet the most urgent needs of all. When the roads are returned to their owners, these stocks must be restored to what they were when government control was adopted, or proper compensation rendered therefor. It is to be assumed that this compensation will be on the basis of the existing prices of materials rather than on the basis of the prices paid for these materials originally, as has been suggested in certain Administration quarters. This restoration of stocks will constitute another large charge to maintenance which the Railroad Administration must bear under the terms of its contract.

Therefore, instead of the railways being over maintained, or even adequately maintained in the broad sense in which maintenance of way should be considered, it is difficult to see how one can arrive at a conclusion other than that, in the aggregate, the government is so far in arrears in its expenditures for maintenance that even by the most strenuous efforts it will be impossible for it to take up during the present working season the accumulation of deferred maintenance which has already occurred. Obviously every effort should now be made to comply in full with the contract requirements in order that the financial adjustment at the end of the period of Federal control may be as small as possible.

Pittsburgh & Lake Erie

THE PITTSBURGH & LAKE ERIE, operating through the heart of the most congested railroad territory in the United States during the war, spent less for coal for locomotives in 1918 than in 1917. The property has, for many years, been remarkable for the low operating ratio which it maintained under difficult conditions of operation. The operating ratio in 1918 was held down to 68 per cent. The property has often been likened to a complicated and extensive yard. The density of traffic is heavy. In 1918, 13,312,000 ton miles were moved per mile of road, an increase over 1917 of 1,543,000 ton miles. The revenue freight haul is comparatively short—an average of 63 miles in 1918 and a little over 61 miles in 1917 . The average train load, however, is extraordinarily heavy; in 1918 it was 1,532 tons which was an increase of 31 tons over 1917.

More than half of the total tonnage of the Pittsburgh & Lake Erie is products of mines. The total tonnage of all commodities carried in 1918 amounted to 45,894,000, an increase of 4,349,000 tons. The increase in bituminous coal tonnage accounted for over three-quarters of the total increase and the increase in the tonnage of ores for the remainder. There were offsetting increases and decreases in other classes of commodities.

Total operating expenses of the property in 1918 amounted $22,365,000, an increase of $5,713,000 over 1917. This increase in expenses, however, was only a little more than commensurate with the increase in revenues. Total operating revenues amounted, in 1918, to $32,992,000, which was $7,371,000 more than the revenues in 1917, or an increase of 29 per cent. The operating ratio (percentage of expenses to revenues) was 67.79 in 1918 comparing with 64.99 in 1917. Railway operating income amounted to $9,743,000 in 1918, comparing with $7,634,000 in 1917 and comparing with $8,980,000, the rental which the government is paying for the use of the property. Leaving aside the question of hire and rentals of equipment, the government made a substantial profit from the operation of the Pittsburgh & Lake Erie in 1918 after paying the company its rental. Setting aside an item—miscellaneous income—with which the Pittsburgh & Lake Erie annual report credits the government income account, non-operating income amounted to about $429,000, and deductions from gross income to $293,000, so that the profit for the government was a little better than the comparison between railway operating income and rental would show.

The particularly interesting thing about the operation of the property in 1918 is the ability which the federal management showed in holding down transportation expenses. These expenses in 1917 amounted to $8,255,000 and increased in 1918 to $10,218,000, or by about 24 per cent; but this was much less than the percentage of increase of wages and of the unit costs of materials to most railroad companies. As previously mentioned, the Pittsburgh & Lake Erie spent less for its locomotive fuel in 1918 than in 1917. The amount spent for fuel for train locomotives was $753,000, a decrease of $117,000, as compared with 1917, and the amount spent for fuel for yard locomotives was $987,000, an increase of only $5,000. The relative amount of fuel used in train service and yard service is a good commentary on the character of the transportation service performed by this property. The largest important increase in transportation expenses was in the wages of yard conductors and brakemen. This amounted to $1,806,000 in 1918, an increase of $422,000 over 1917. Compare this with the increase in wages of train enginemen. These wages in 1918 amounted to $597,000, an increase of only $71,000 over the previous year. The wages of trainmen amounted to $878,000, an increase of $188,000.

The increased cost of maintenance on the Pittsburgh &

Lake Erie is comparable to that of other eastern roads. Maintenance of way cost $4,374,000, an increase of $1,481,000 or about 50 per cent. The cost of maintenance of equipment was $7,038,000 in 1918, an increase of $2,243,000 or about 47 per cent.

The annual rental which the corporation received was ample to continue 10 per cent dividends and to carry a safe amount over into surplus. In deducting interest, war taxes and corporate expenses from rental and about half a million dollars for corporate income, there was $6,825,000 remaining. The 10 per cent dividend calls for $3,599,000. In addition to this, the company also subtracted in its income account $1,767,000 as revenue and expenses applicable to the period prior to January 1.

The government, on December 31, 1918, still owed the Pittsburgh & Lake Erie $7,580,000 out of the $8,980,000 rental, and, in addition, the government owed the company for cash, materials and supplies, etc., taken over on January 1, 1918, $13,333,000. The corporation had in its own treasury $398,000 cash at the end of 1918. The company had loans and bills payable of $5,375,000 at the end of 1918, $1,799,000 of unmatured dividends declared, and owed the government a total of $11,836,000, which included $7,025,000 liabilities of the corporation paid by the government, and $1,786,000 advanced by the government for additions and betterments.

The following table shows the principal figures for operation of the property under federal management. This is not the corporate income account.

	1918	1917
Mileage operated	225	225
Freight revenue	$28,513,514	$21,139,925
Passenger revenue	2,287,179	2,349,133
Total operating revenues	32,992,273	25,621,654
Maintenance of ways and structures	4,374,228	2,893,049
Maintenance of equipment	7,038,496	4,795,678
Traffic expenses	187,253	194,455
Transportation expenses	10,217,617	8,254,964
General Expenses	502,055	452,138
Total operating expenses	22,365,184	16,652,502
Taxes	884,277	1,334,963
Operating income	9,742,766	7,634,163
Gross income	*11,940,692	7,856,878
Net income	11,647,561	7,435,472

*After the company has credited the government with $1,768,848, "miscellaneous income," in addition to the rentals which the government received from equipment.

CORPORATE INCOME ACCOUNT

	1918.
Rental	$8,980,219
Gross income	9,544,051
Net income	6,825,489
Dividends	3,598,560
Surplus	*3,226,929

*The company subtracts from this surplus, on its own income account, $1,767,378 as revenues and expenses applicable to the period prior to January 1, 1918, paid for by the Railroad Administration on account of the corporation.

New Books

Trautwine's Civil Engineer's Pocketbook. Twentieth Edition, by John C. Trautwine, revised by John C. Trautwine, Jr., and John C. Trautwine, third. Bound in flexible leather, 6 in. by 4 in., 1528 pages. Published by Trautwine Company, 257 South Fourth street, Philadelphia. Price $6.

The first issue of the twentieth edition of this well-known reference to civil engineering constitutes the 140th thousand. Aside from a desire to bring the work up to date, the object of this revision is to extend the section on railway engineering. Thus the portion on track and track work has been increased from 35 to 94 pages, the matter on curves from 10 to 108 pages, while the subjects of train resistance, train operating costs (railway economics) constitutes a new department covering 38 pages. Railway construction costs which previously received but minor mention have been extended to 36 pages. The treatment and arrangement of the matter in this issue conform very closely to the typographical standards of previous editions.

Letters to the Editor

Railroad Troubles Due to "Inadequate Revenues"

NEW YORK.

TO THE EDITOR:

According to my view of the matter the fundamental cause of the difficulties in which our railway system is now involved is to be found in inadequate revenues. This is probably due to a long series of historical causes, principal among which is the way in which the problem has been presented to the Federal courts. Owing to the fact that the courts have been resorted to to prevent confiscation it has come to be quite largely accepted that the railways, instead of receiving what their services are fairly worth, should be allowed to charge for them only sufficient to save their properties from confiscation. People who would ordinarily scorn to demand something for nothing have been educated to believe that it is proper to require a railway company to work for a bare living, and many times the wage allowed has been pared so thin as to reduce the railway to poverty and in some cases to force it into bankruptcy.

It is perfectly true that the railway service is so much a part of our present life that it is affected with a public interest, but this does not mean that the railway must work for starvation wages. It means that it must treat all citizens of the country without preference or prejudice—without discrimination as between persons. It must not charge one person one price and another a different price for a like service. It must not render one better service for a given price than it gives another for the same price. It is as much bound to treat all equally as is the county clerk or the judge of the court. Nor can it be allowed to take advantage of its strength and extort or otherwise oppress those who are dependent on it. But if it charges only what its services are fairly worth, it cannot be considered to be guilty of oppression or extortion. And if traffic is freely offered to it at a particular rate the rate surely cannot be considered extortionate.

Many people seem to believe that the fairness or unfairness of a rate of charge for a particular service is dependent on the cost undergone by the servitor in rendering that service, but a moment's consideration should be sufficient to show the absurdity of that view. Very few producers of identically equal services or commodities produce at equal costs, yet this demand that the price shall be based on the cost of the thing offered carries necessarily the corollary that the low cost producer must sell at a correspondingly lower price, and that the high cost producer is entitled to receive a higher price for a product no better. This not only tends to encourage incompetence but directly to promote inefficiency. It is merely another form of the same vice as underlies all propositions calling for a government guarantee.

What should be given the railways and all other public service corporations is not a government guarantee but an opportunity to earn what their services are fairly worth. Let the government get off their backs and give them a chance to render efficient service at a fair price. They need only to be unshackled. It is not necessary to ask the taxpayers to support them. The right rule is to reward the producer in accordance with the value of his product, and the value of his product does not depend on what it cost him to produce it but upon its utility and on what it would cost to duplicate it.

When the foregoing considerations are applied to railway

rates it becomes apparent that whatever else may be said of it, it is not true that a railway rate is extortionate or excessive or unfair if traffic moves freely under it and it bears proper relation to other rates; *i.e.*, does not involve unreasonable preference or discrimination in favor of one class of traffic or one rate payer as against another. There are those who are concerned lest under such a system of rates the carriers should grow too rich. I cannot believe that anybody can become too rich by producing and selling either services or goods at fair prices, and it seems to me that the alarm of these people is based at least in part on envy. However, it is perfectly apparent that none of the railways can operate without enjoying special franchises to cross public highways, and I willingly concede the right of the government to exact for the use of such privileges their fair value, just as I contend that the carrier should receive for its services their fair value.

The Act to Regulate Commerce declares that all rates charged by railways shall be just and reasonable and it prohibits unjust and unreasonable charges and exactions, but aside from the "long and short haul" clause in section 4 it contains little to guide an administrative commission in determining what constitutes a just and reasonable rate and the Interstate Commerce Commission lacking statutory guidance in this regard has been largely influenced by the dicta in the Supreme Court's opinion in Smythe vs. Ames, a case brought for the prevention of confiscation. It thus has happened that the action of the Commission in disposing of rate cases brought before it has frequently resulted in rates too low to produce the amounts of revenue necessary for efficient operation and development of the railways.

I believe that the object which should be principally sought in the revision of the Act to Regulate Commerce is the best method of securing efficient service at fair and non-discriminatory rates, and that the foremost essential to efficient service is adequate revenue. Next in importance perhaps is stability of rates, particularly in freight service, so that the commercial and industrial elements of the community may know what to expect in the way of transportation charges and may be governed accordingly in making their contracts and other business arrangements. The provision requiring thirty days' publication of proposed changes in rates is sound, and if there were any demand for it I see no valid objection to requiring a longer notice, but the provision authorizing the Commission to suspend proposed increases in rates should be stricken out. Such a provision merely invites litigation and controversy. It also operates unequally as between the carrier and the shippers. If an increase in a rate is unjustified the shipper can always recover from the carrier, but if it is justified the carrier is unable to recover from the shipper for the difference between the old rate and the new during the period of suspension.

Another matter of great importance is the prevention of dishonest financing. A large part of the prejudice under which the railways have suffered in times past has been due to the disgust aroused in the minds of the public by scandals such as those resulting from the methods used in financing the Alton, the New Haven, the Rock Island and the Frisco. Many if not all of the breaches of trust found in those cases might have been prevented by thoroughgoing publicity such as is provided for in the British "Companies' Acts," and those statutes should be carefully considered in revising the Federal statutes relating to railways.

I favor the Federal incorporation of railways engaged in interstate and foreign commerce for the reason that the present system of regulating such railways is too cumbersome and it seems to me necessary that railway systems whose lines lie in two or more states be relieved from the complications involved in state control. I do not believe that this can be effectually done while such carriers are incorporated under state laws.

The necessity for Federal incorporation is not so great in the case of a railway whose lines are wholly within a single state. All that seems to be necessary in such a case is that its rate structure shall be harmonious throughout and that the rates for its intrastate traffic shall not be inconsistent with those for its interstate traffic and that of its competitors. Such carriers should be permitted to continue to engage in interstate commerce on condition that they make their intrastate rates conform to interstate rates so far as they affect interstate or foreign commerce.

W. J. MEYERS,
Formerly Statistician of the Interstate Commerce Commission.

S. J. Konenkamp, president of the Commercial Telegraphers' Union of America, addressing a meeting of 175 strikers in New York City last Sunday, declared that the operators' strike was going more successfully in the West than in the East. He said that in one instance strikers had threatened a "scab" with the alternative of leaving town or having a rope put around his neck. He related also how an automobile full of strikebreakers had crashed into a telephone pole in Jacksonville, Fla., and said that seven persons were sent to the hospital. Mr. Konenkamp said he didn't know how it came about, "but that our people were fined $10 and costs." He said the fight now was between unionism and Burleson. "Mr. Burleson's logic is that you must use force. Our fight now is not so much against the telegraph companies as it is against the Government. It was the Government that refused us." Except for the statements of Mr. Konencamp little or no evidence of a strike of telegraphers is published.

From the Atlanta Constitution

Congress' Little Problem of Reconstruction

Grand Trunk 0-6-0 Type Switching Locomotives

Twenty-five Engines, with 36,700 Lb. Tractive Effort, Building at the Point St. Charles Shops

AN ORDER OF 25 SIX-WHEEL SWITCHERS is being filled for the Grand Trunk Railroad at its Point St. Charles shops, Montreal. These engines, which are known as the road's class F9, have a tractive effort of 36,700 lb., and weigh 166,000 lb. in working order. Compared with the next preceding class of switchers, it will be seen in the table that the tractive effort has been increased from 31,460 lb., or 5,240 lb. This has been effected by an increase of 10 lb. in the boiler pressure, one inch in the diameter of the cylinders, and a decrease from 56 in. to 51 in. in the diameter of the drivers. In addition, a boiler of considerably more liberal proportions has been provided; the evaporating heating surface has been increased from 1,423 sq. ft. to 1,945 sq. ft. and the grate area from 27.4 sq. ft. to 50.6 sq. ft.

COMPARISON OF GRAND TRUNK SWITCHING LOCOMOTIVES

	New type	Previous type
Cylinders, dia. and stroke, in.	22 in. by 26 in.	21 in. by 26 in.
Diameter of drivers, in.	51 in.	56 in.
Steam pressure, lb.	175	165
Grate area, sq. ft.	50.62	27.44
Water heating surface, sq. ft.	1,945	1,423
Superheating surface, sq. ft.	408	268
Weight on drivers, lb.	166,000	139,500
Tractive effort, lb.	36,703	31,460

The boiler is of the extended wagon top type, designed for 175 lb. per sq. in. working pressure. It contains 178 two-inch tubes and 28 5⅜-in. flues, 12 ft. 4 in. in length. The firebox has a sloping mudring, which extends forward over the rear pair of drivers. It is 96⅞ in. long by 75¼ in. wide, and is fitted with a brick arch carried on four three-inch tubes. The boiler is fitted with a 28-element type A superheater, and has a power operated firedoor. Other boiler accessories are Hancock lifting type injectors, double turret valves, for the convenience of both the engineman and fireman, and two Okadee blow-off valves, both of which are fitted in the throat sheet of the firebox.

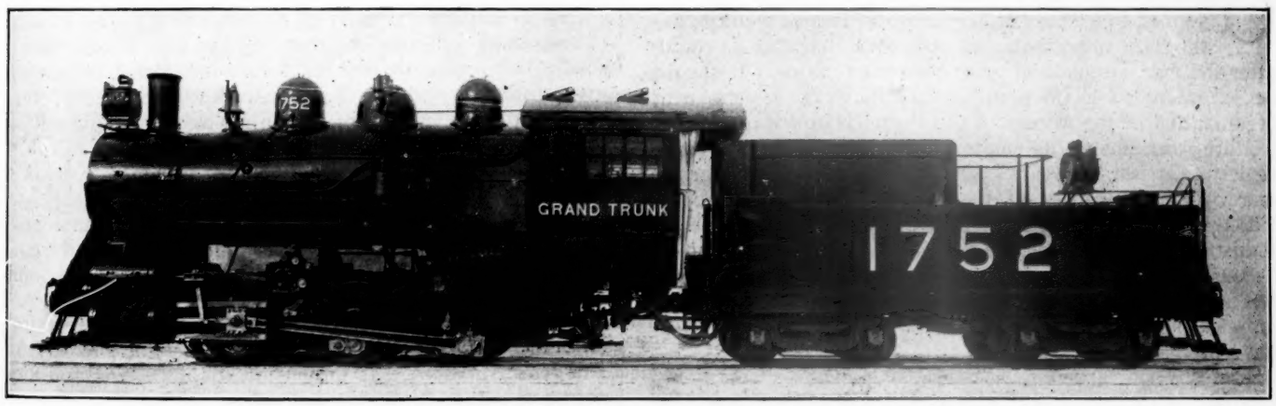
The design of the frames and running gear is straightforward and substantial, and the frames are well braced with cast steel crossties between the drivers. The front ends of the frames are bolted to a heavy cast steel deck plate, and the bumper beam is also a steel casting. The pedestal jaws are fitted with adjustable driving box wedges.

In order to provide for a main rod of ample length with the short wheel base, the main drivers have been placed at the rear. The steam is distributed by 12-in. piston valves driven by the Baker valve gear, and the distribution is controlled by a Ragonnet valve gear. The valve chambers and cylinders are both bushed with Hunt-Spiller gun iron and the same material is used for both piston and valve packing rings. The piston rods are fitted with King metallic packing.

Considerable attention has been given to the design of the cab in order to provide ample room for the crew, and especially to secure ample deck space for the fireman. Care has been used in the location of all of the cab fittings and particularly to the throttle lever, reverse lever and brake valve, and the steam, air and water gages, to place them so that they may easily be read by both the engineman and fireman.

The tender is carried on four-wheel trucks of the equalized pedestal type, with 5½-in. by 10-in. journals. The tender frame is built up of structural section with 13-in. channel center sills and side sills of 10-in. channel section. The rear end of the frame is finished with a cast steel bumper beam. The engine and tender connection is fitted with the Radial buffer.

The tank has a capacity of 6,000 gal. and is fitted with a coal space of nine tons capacity. The tank is of the rectangular type, and has been built long and low in order to provide for an unobstructed view looking forward from the cab. For the same reason the tank has been built with a coal space of the water leg type, the sides of which are built up straight above the top of the tank, thus leaving a clear view over the top of the tank at the sides of the coal space from either side of the cab.



Six-wheel Switcher, Designed and Built by the Grand Trunk Railway

The principal dimensions and data are as follows:

General Data

Gage	4 ft. 8½ in.
Service	Switch
Fuel	Bituminous coal
Tractive effort	36,700 lb.
Weight in working order	166,000 lb.
Weight on drivers	166,000 lb.
Weight of engine and tender in working order	296,000 lb.
Wheel base, driving	11 ft. 6 in.
Wheel base, total	11 ft. 6 in.
Wheel base, engine and tender	45 ft. 9½ in.

Ratios

Weight on drivers ÷ tractive effort	4.5
Tractive effort × diam. drivers ÷ equivalent heating surface*	732.0
Equivalent heating surface* ÷ grate area	50.5
Firebox heating surface ÷ equivalent heating surface,* per cent	7.6
Weight on drivers ÷ equivalent heating surface*	64.9
Volume both cylinders	11.4 cu. ft.
Equivalent heating surface* ÷ vol. cylinders	223.5
Grate area ÷ vol. cylinders	4.4

Cylinders

Kind	Simple
Diameter and stroke	22 in by 26 in.

Valves

Kind	Piston
Diameter	12 in.

Wheels

Driving diameter over tires	51 in.
Driving, thickness of tires	3½ in.
Driving journals, main, diameter and length	9½ in by 12 in.
Driving journals, others, diameter and length	9½ in. by 12 in.

Boiler

Style	Wagon top
Working pressure	175 lb. per sq. in.
Outside diameter of first ring	68 9/16 in.
Firebox, length and width	96⅞ in. by 75¼ in
Firebox plates, thickness	tube ½ in., crown, sides and back, ⅜ in.
Firebox, water space	front 5½ in., back and sides 4½ in.
Tubes, number and outside diameter	178 2 in.
Flues, number and outside diameter	28 5⅜ in.
Tubes and flues, length	12 ft. 4 in. over sheets
Heating surface, tubes and flues	1,751 sq. ft.
Heating surface, firebox, including arch tubes	194 sq. ft.
Heating surface, total	1,945 sq. ft.
Superheater heating surface	408 sq. ft.
Equivalent heating surface*	2,557 sq. ft.
Grate area	50.6 sq. ft.

Tender

Tank	Water bottom
Frame	Steel channel
Weight	130,000 lb.
Wheels, diameter	33 in.
Journals, diameter and length	5½ in by 10 in.
Water capacity	6,000 gals.
Coal capacity	9 tons

*Equivalent heating surface = total evaporative heating surface + 1.5 times the superheating surface.

Co-Operation*

By W. W. Atterbury

Vice-President of The Pennsylvania Railroad Company

ORIGINALLY IN DISCUSSING the Women's War Relief it seemed to me that of all the work, that of welfare was the most important, and of such a character as could, after the war, be made of great permanent value. It should be so organized as to permit, after the war, a permanent organization of the women of the Pennsylvania Railroad for welfare work among its employes. As a result of my experience of the last two years I have had no reason to change my mind. The industries of the world have been destroyed. Their immediate rehabilitation is essential. The wheels of industry must be started. The matter is now being studied by our most able financiers, who themselves realize that unless a solution is found our own destruction will ensue. I am confident that in a short time a successful solution will have been evolved.

Many years ago the question was asked "Am I my brother's keeper?" The universal answer has been "Do others or they will do you"—"Each for himself and the Devil take the hindmost." And selfishness—national and individual—was triumphant. The selfishness of one nation got beyond bounds and tried to impose itself upon all the other nations. The war was the result. Blood has washed the slate. What answer to that age-old question will now be written?

For nearly two years I watched with breathless interest labor conditions as they developed on the other side—England in the throes of a social revolution; France with her industrial population ripe for anything; Italy at any moment ready to break into anarchy. . . . In four wars America has fought for life, liberty and for the right to the pursuit of happiness. Trying to put myself in the other fellow's place, I have tried to define what that right means. It seemed to me that the following at least were essentials: (1) Steady employment; (2) At a good wage; (3) Time for recreation; (4) Opportunity to elevate myself in my employment; (5) A voice in determining the rules and regulations under which I should work; (6) A fair division of any profits after a reasonable wage had been earned and a sufficient amount paid to Capital to attract it to an expanding business. Given these, would it mean contentment to me and to my family? Would they enable me to give to my children greater advantages than I had myself enjoyed? Would these principles, if universally applied, give to our country and to the world at large what we believe to be our inherent right?

Society can no longer regard labor as a commodity. I hate the word "Labor" as ordinarily used, as it represents class distinction, for which there is no place in our American life. We all labor—some with our hands; some with our heads. Therefore, when I say labor I mean "all who labor." Heretofore it has been considered a commodity, subject to the law of supply and demand; but from now on we must so set our house in order that all may have steady employment—a difficult job, I grant you, but one not impossible of solution by collaboration between producers, consumers and transporters. . . .

In every man's breast, latent or active, is the desire to improve his condition. It has been our boast that America meant Opportunity. I believe this is as true today as it ever was; but industrial competition has forced us to methods which, as applied to many individuals, have made their work so monotonous and uninteresting that the seed of ambition has failed to germinate. On these the sunlight of opportunity, by education and change of employment, must be allowed to shine.

I asked myself: Ought not I to be taken into the confidence of my employer; be advised as to his aims and his troubles; be permitted to make suggestions in the light of my experience, and conferred with in regard to conditions of work so intimately a part of my every-day life? I could but answer "Yes!"—and with the feeling that I could thereby be a better man for my employer; for thus I become an active, intelligent and willing instrument for the success of my employer, instead of an unintelligent and unwilling tool.

The success of any business is gauged generally speaking, by its profits. There are two elements to an established business: the capital invested and the personnel employed. A stable return to capital is as essential as is steady employment to the individual. Capital has no brains and does not think. To the personnel of the business it is entrusted by its owners, who do think; and what they think gauges their point of view as investors. If stable and certain, a low return is asked. If the business is uncertain, and any return a chance, a high return is asked.

Nor can we change this. By revolution and anarchy we can wipe capital out, but with it go all rights to property of any kind, and even civilization itself.

Therefore, we as individuals, unless we are anarchists, are interested in the success of the business by which we are employed.

It is difficult, however, to make the large mass of those who labor appreciate the truth of this. So something more tangible and direct is necessary to bring about the individual interest so essential to the success of the business, than mere logic and economics. Profit-sharing in a small business is comparatively simple, but with industrial combinations—so essential to modern business life, if we are to meet the world competition—it is difficult to allocate to one efficient man his individual share in the profits, although we know that on the efficiency, or lack of it, of the individuals taken collectively, depends the success or failure of the business. Granting, however, the principle, we shall have taken the first long step, and with mutual confidence established I am certain that the way can be made clear.

*An address given before Department No 2, Pennsylvania Railroad Women's Division for War Relief at Philadelphia, Pa., June 26, abridged.

Tie Purchasing Methods Subject of Conferences

Correspondence Between Producers and Division of Purchases Reveals Positions of Both

THE CENTRALIZATION of the purchase of cross ties for all of the railroads under federal control in the hands of the Division of Purchases of the United States Railroad Administration has resulted in the introduction of many radical changes in the methods of producing and selling ties, as was described in the *Railway Age* of May 30, page 1305. Some of these changes have been opposed by the producers of ties. For the purpose of presenting their views to the Division of Purchases, a committee from the National Association of Railroad Tie Producers waited upon the director of the division on April 15, presenting a brief and certain recommendations, which have recently been made public. An abstract of this brief and of the correspondence which has followed subsequently is given below.

Tie Producers' Brief

The more reputable tie producers have always agreed upon the necessity and desirability of both standard specifications and standard inspection for controlling the purchase of cross-ties. Prior to the creation of the United States Railroad Administration it was impossible to reach any universal agreement upon standard specifications among the producers or the railroads. It is a source of satisfaction to us that standard cross-tie specifications are now an accomplished fact, and we desire to express our unqualified endorsement of the principle of a standard specification.

The purchase of all cross-ties by the line upon which they are produced, and restrictions as to the sale of these ties to the producing road only, is a direct limitation of markets. The effect of this ruling created radical changes in the very fundamentals of operation that had been in effect by numbers of tie organizations for a considerable period in the past, and some small measure of these radical changes can be determined by the realization that if the railroads prior to the war had attempted to decide, by common agreement, with power invested exclusively in themselves, that they would nationally agree on the prices and methods of purchase, there would have been grounds for legal recovery of damages to such concerns as the tie producers.

The producer is told he must absolutely deal with a certain railroad or certain officers; that he must deal with them under their own prices and terms; that the conditions are arbitrarily imposed and subject to change without his partaking in any way in establishing the prices or conditions affecting, very fundamentally, not only his possible profit and volume of business, but also the value of his standing timber, which he has carried on his books as an asset based upon his knowledge of timber values as they have existed in the past.

The limitation of the markets for cross-ties has not only been applied to the disposition of ties for use by the United States Railroad Administration, but producers have also been instructed to refer all inquiries from trolley lines and industries for cross-ties to the United States Railroad Administration for fulfillment. One of the most serious questions that must be answered by co-operation between the tie producers and the railroads is the disposition of cross-ties which do not conform to the present specifications.

The establishing of a proper price, neither too high nor too low, on all of the various kinds and grades of ties, in the numerous and extensive tie-producing territories, is a matter that cannot be brought about by any arbitrary power, no matter in what man or group of men that power might be invested. The real basis for the proper price to be paid for a commodity is the law of supply and demand. The proper price to pay for cross-ties, or any other commodity, must be justified in the final analysis by reconciliation with this cardinal rule of business prudence.

The purchaser of cross-ties must necessarily have for his main objective the obtaining of certain kinds and grades of cross-ties delivered at the lowest possible cost at the point of consumption.

There is a well defined and clearly established basis of comparison of values of certain grades and kinds of cross-ties produced in the various regions. For example, a sap pine tie produced in Louisiana is known to be of the same value to the railroads as a sap pine tie produced in Mississippi. Under the present schedule of prices and freight rates, the purchaser of cross-ties must pay $1 for a No. 3 Louisiana sap pine tie delivered at Chicago, while the same tie when shipped from Mississippi will cost him only 79 cents. This difference of 21 cents per tie cannot be accounted for in service to the railroad, and neither can the producer from either territory justify any reason why the purchaser should be required to make any difference in price as long as there is no difference in value.

The cross-tie circular of the St. Louis-San Francisco, in the Southwestern region, shows prices effective to June 30, 1919. There is no mention made, nor has there been any assurance given, that the cross-ties on hand as of June 30, 1919, made on the basis of the prices published, would be taken up and paid for at prices named in the circular. Cross-ties are not produced in a day, but it takes an average of six months from the stump to the right of way, and often longer. Should producers quit making ties and devote their efforts to hauling their ties, wherever this is possible, so as to deliver them before June 30? Under the former system of purchase of ties, the producer had a contract assuring him of a market for his ties, in most instances before they were produced.

Specific Suggestions

(A) The producing roads should continue to purchase, at the present prices, such ties as are offered up to Nov. 1, 1919.

(B) Any railroad may immediately enter into contracts with individual tie producers at prices not to exceed those prices now in effect at point of shipment for deliveries up to November 1, 1919, providing that the quantities and kinds of ties contracted for are approved by the United States Railroad Administration.

(C) All cross-ties should be inspected by the regional inspectors at point of shipment.

(D) The purchase of cross-ties for deliveries after November 1, 1919, should be made in accordance with the following plan:

(1) All railroads should register their annual cross-tie requirements with a central advisory purchasing committee, and all railroad ties should be purchased in accordance with nationally standard specifications.

(2) All railroad ties should be inspected by regional inspectors, in accordance with standard rules for the application of the specifications.

(3) The individual roads should enter into contracts for their cross-tie requirements directly with responsible tie producers, filing copies of any contracts made with the proper department of the United States Railroad Administration.

(4) All contracts should be awarded only after fair and open competition has developed the lowest price per tie obtainable from responsible tie producers. Reasonable assurance of the producer's ability to meet his obligations in the time required should determine the quantity of the ties to be covered in any contract.

(5) In the event of a producer being delinquent in the specified deliveries of certain kinds of ties, the United States Railroad Administration may prohibit his acceptance of any additional business for the same kind of ties.

(6) The purchase of all cross-ties by the individual roads

should be effected through nationally standard forms of contracts approved by the United States Railroad Administration.

The Railroad Administration's Reply

The reply of the Railroad Administration to this brief was made by H. B. Spencer, director of the Division of Purchases under date of May 29, of which the following is an abstract:

Before answering your various suggestions in detail, it seems desirable to review briefly the situation which led to the conditions which you now seek to improve. The federal authorities took control of the railroads on January 1, 1918. The organization of the Division of Finance and Purchases was completed about ten weeks later. We were immediately confronted with the following situation: For at least two years the production of railroad cross ties in the country had not kept pace with the requirements of the railroads. The business of supplying the railroads with cross-ties was almost entirely in the hands of contractors, who in spite of their best efforts and for reasons which they could only partially control, such as a depleted labor supply and congested transportation conditions, had been unable to supply the needs of the railroads in full. This had brought about a most demoralizing and destructive condition. The railroad companies had repeatedly revised and increased the prices paid under existing contracts, in order to obtain deliveries, and the more aggressive railroads were profiting in that respect at the expense of the weaker lines. Shipments were being held back by producers in the expectation of higher prices and instances were discovered where the same lot of ties had been repeatedly sold to several different roads, each time at a higher figure or under laxer inspection. A survey of the whole situation showed hundreds of unfilled contracts aggregating millions of cross ties, which had been sold by the contractors to individual railroads for delivery during 1915, 1916 and 1917, and which had not been delivered. The production was diminishing instead of increasing and it was vitally necessary that instant action should be taken to correct and improve these conditions.

With the introduction of federal control and operation of the railroads, competition between the individual lines for their supply of cross ties instantly and automatically ceased and the administration's problem was reduced to stimulating and increasing the production of ties as rapidly as possible, establishing a common standard, and distributing the available supply among the individual railroads in proportion to their relative necessities. The steps taken by the administration to solve this problem have resulted in the situation which led to our recent conference.

Proceeding now to answer the specific suggestions presented by your committee: The attitude of the Railroad Administration is not one of antagonism to the large tie producers. On the contrary, it is recognized that their established organizations, their knowledge and experience in the business can be of the utmost assistance to the administration in bringing about the results which are necessary to the proper maintenance of the railroads, and it has been and is the desire of the administration to utilize all of the facilities and the best efforts of the large tie producers to the fullest extent compatible with the best interests of the railroads themselves in securing their supply of cross ties.

In the matter of standard specifications, we were in substantial accord.

With regard to the limitation of markets, we could not agree to the proposition that the individual roads should be released from the regulation of obtaining through the agency of the central administration and the traversing roads such cross ties as they may have to draw from territory beyond that which they themselves traverse, and that they be permitted to deal and contract with any and all tie producers independently of that regulation. The necessity for central control of the distribution of available ties between federally-controlled roads according to their relative needs, as referred to above, is the vital reason for refusing to permit direct contracts between the individual railroads and individual contractors, except on the producing roads.

The so-called fixed prices are maximum ones only and even in that respect they are not absolute and beyond reconsideration. Prices in any given territory have been arrived at after careful consideration and by negotiation between the buying roads and the producers. They may be made the subject of negotiation again if that should become necessary.

The prices originally published obviously were not determined upon to strangle production, but on the contrary were made on a level high enough to induce tie producers of all classes to increase production. It was our belief that production was low rather for want of labor than on account of unremunerative prices. Now when labor recently has become more plentiful, cross tie production has increased remarkably and ties are coming to the roads at present in larger quantities than at any time in the past.

At the moment no objection could be seen to complying with your request that such ties should be bought at an f. o. b. price based upon certain commercial delivery centers to which through freight rates are in existence, but such an arrangement would require a detailed study of each situation. The railroad administration is prepared to consider each locality in detail whenever presented.

Upon the uncertainty as to future prices, it was stated that a duration of time for purchasing ties could not well be given or maintained for purchases made under publicly posted prices. In many cases, however, contracts have been made for a specific number of ties, the delivery of which extends under the contract for a definite period, in some cases to June 30 next, in other cases until the end of the calendar year.

We are not undertaking to dictate to steam roads not under federal control and trolley lines how they should buy their ties, nor to control them in their methods, nor to combine with them. We have consulted with them only where our interests are common and are endeavoring only to increase the output of suitable and satisfactory ties for our respective needs, taking into consideration the interests of all classes of tie producers.

At the end of our interview, we defined our position with respect to the specific suggestions made to you, by summing up as follows:

1: That the administration will not agree to discontinue the purchase of ties direct from the small producer.

2: The price to be paid for cross ties, whether to the small producer or to the larger producer, is a matter of negotiation between such producers and purchasing agents of the roads traversing the producing territory, and that this negotiation is done under the supervision of the regional purchasing committees and in conjunction with them.

3: The administration will adhere to the policy of publishing the prices the roads will pay for cross ties, such prices to have been arrived at by negotiation as above.

4: The director of purchasers will make contracts in the name of the administration with large tie producers for given quantities of cross ties for allotment to the different roads, if satisfactory terms for delivery, prices, quality, etc., can be arrived at.

Tie Producers' Rebuttal

In behalf of the National Association of Railroad Tie Producers, J. W. Fristoe, president of that organization, replied to Mr. Spencer as follows on June 11:

There are certain fundamental principles connected with the purchasing of cross ties that involve the question of how far the concentration of the purchasing power of the government may be developed into one single agency before it becomes an oppressive factor in the conduct of purchases for the railroads. The intent and purpose of well known federal statutes, such as the Sherman Anti-Trust law, and the Clayton law, covering the method of purchasing to be employed by common carriers, has taught us to look upon the limitations of our markets, and the fixing of cross tie prices by the railroads, as the exercising of a power temporarily justified as an emergency war measure, but an authority which would be immediately abolished together with the dissipation of similar restrictions originally placed upon other commodities purchased by the railroads.

We, of course, cannot question your authority to limit our markets and fix cross tie prices, but we feel justified in

questioning the propriety and fairness of any such restrictions. Our attitude in this matter appears to be in substantial accord with the recent statements of the director general in speaking broadly of the purchasing policy of the United States Railroad Administration, which we take the liberty of quoting herewith: "It (the United States Railroad Administration) is trying to handle this purchasing matter in a reasonable, businesslike way largely through the methods which were employed under private management and with an effort to prevent any concentration of the purchasing power by the Government into one single agency in such a way as to be a disturbing or an oppressive factor in the conduct of purchases for the railroads."

The plan we suggested for your consideration surely complied with all of the principles that might be inferred from the statement of the director general, with the added advantage to the administration that the supervision of a centralized purchasing agency was conceded in the hope that this supervision would not become oppressive.

In reference to the definition of your position as summarized in your letter, we wish to make the following statements: We did not suggest, nor do we subscribe to, any plan making a distinction between the large and small producer. There is a specific provision in item 4 of the plan we suggested wherein the railroads could purchase in as small quantities as may be desired. The advisability of purchasing from tie producers of various capacities would prove itself in each instance, and the advantages should be so clearly self-evident as to carry their own weight when measured by common business prudence.

We wish to correct at this time any inference that the price to be paid for cross ties is or has been a matter of negotiation, if by negotiation is meant a mutual agreement based upon the usual rights of buyer and seller. The objections to the prices published by the administration arises from the fact that the administration is by far the largest purchaser of cross ties in the United States, and when it establishes maximum prices that will be paid for cross ties, it places our industry in the undesirable and unusual position of having the price of a commodity established by the largest consumer.

Reward of Being Conspicuously Good

By L. F. Loree

President, The Delaware and Hudson

I DO NOT PROPOSE to weary you with a review of the achievements of the railroads. The enormous improvements in the science and art of railway transportation are the product of the managers of the American railways. These men have been pioneers in fields exclusively their own and have so far succeeded that the American railway system fas able at the end of 1917, to handle far greater tonnage with relatively lower expenditure of power, including labor and fuel, at a lower capital cost per unit of traffic, and to carry both passengers and freight at the lowest rates in the world, while paying the highest rates of wages anywhere received by men similarly qualified.

It may well be asked why, in the light of these achievements, the institution should have been for the past fifteen years the favorite object of vilification and abuse.

I cannot help but feel that to a large extent the railways fell a victim of their own virtues. The extent to which they energize and stimulate development, the growing dependence of the community on their proper functioning, and the high standard of the conduct of their business, all place them at the extreme on the side of goodness.

Consider the case of Aristides. Here was a man who, 500 years before Christ, was a leader among the Greeks. He had been the strategist of their army at Marathon; he had been archon, the highest magistrate of Athens, and he was standing as a candidate for re-election. A voter, not recognizing him, approached him and asked him to inscribe the name of Aristides on the negative ballot that he was to cast, and the archon put to him the question, "Why are you against Aristides? Has he done you an injury?" And the man said, "No, I do not even know him, but it irritates me to hear Aristides everywhere spoken of as 'the just.'"

The history of twenty-five centuries, the history of a thousand saints and martyrs, all demonstrate that it is at least as hazardous for a man or an institution to be conspicuously good as to be conspicuously bad.

Whatever may be our feeling about this matter, I am sure we will all unite in recognizing as a question of present greatest importance the railroad problems of to-day. The experience of the past 18 months has very definitely cleared away some of the fantasies. We are not going to have government ownership. We are not going to have a five-years continuation of the present impossible conditions. We are not going to have a Secretary of Transportation, with an elaborate departmental staff. We are not going to have federal incorporation and a consequent excessive centralization. With these major suggestions go many and various minor vagaries of the speculative mind, the chief of which was perhaps the notion that the railroads of the country as a whole could be reconstructed new at substantially less cost than the total of their capital securities. The fact is that under present conditions $35,000,000,000 would be inadequate to reproduce the properties that are now represented by about $18,000,000,000 of securities.

In all their variety the railroad problems hang on the one fundamental condition—the credit of the properties. There must be such a basis of rates as will yield a return adequate to command the confidence of the investor whose capital is solicited for new enterprises or for the expansion and improvement of the old ones. To ensure this it will be necessary, in my judgment, to secure the following changes in the present Act to Regulate Interstate Commerce:

1. The power of the Interstate Commerce Commission should be extended to cover state rates which in any way affect interstate commerce.

2. The power of the Interstate Commerce Commission should be extended to labor disputes, so as to require the wages and conditions of employment should be just and reasonable. Employes should be forbidden to conspire to interrupt interstate commerce. Strikes should be permitted only on the condition that the dispute must first have been submitted to the Interstate Commerce Commission and, subsequent to its decision (or its failure to decide within six months), there must be a vote to strike which vote should be by secret ballot on a question defined by the commission, the taking and counting of the vote being supervised by a Bureau of Interstate Transportation.

3. A Bureau of Interstate Transportation should be created to operate under the direction of a chief, to be designated from among the members of the Interstate Commerce Commission, but during the period of such designation not to perform any duties as commissioner; this bureau to take over all the executive and administrative functions of the commission.

4. The Interstate Commerce Commission should become wholly an adjudicating body; the term of office after the retirement of the present commission should be extended to nine years. The country might be divided into five interstate commerce regions, the natural traffic divisions of the United States, and one Commissioner should have his office in each of those regions, leaving three to sit in Washington. Commissioners assigned to regions should perform only such duties as may be assigned to them by the three remaining in Washington, and these three to exercise all the powers of the commission except those thus assigned.

5. The Interstate Commerce Commission should no longer

*From an address at the Scranton Club, Scranton, Pa., June 12, 1919.

be permitted to institute proceedings of its own volition. The Bureau of Interstate Transportation (as well as persons) to be a complainant before the commission.

6. The Interstate Commerce Commission should be required as soon as practicable to fix, either for the United States as a whole or for each interstate commerce region, the percentage by which existing rates ought generally to be increased in order to meet expenses and provide proper revenues. No rates not exceeding the present rates by more than these percentages should be regarded as unreasonable in themselves but any rate may be condemned in case it is found to produce unjust discrimination. Until these maximum percentages are given effect, the secretary of the treasury should pay to each system surrendered from Federal control the difference between the actual income and the standard return under the Federal control act if the actual income proves to be less.

7. The secretary of the treasury should be authorized to settle and pay claims on account of acts or omissions of Federal officers during Federal control, and on account of just compensation for the use of the properties. Many such matters will be left open at the end of Federal control and there should be an expeditious method of obtaining just settlement without litigation similar to that under which the War Department is empowered to settle claims growing out of orders for munitions, etc. Appeal to the court of claims should, however, be allowed in cases in which agreement is found to be impracticable. Provision should also be made for funding of balances due the United States on account of additions and betterments to the properties during the period of Federal control. The acceptance of serial notes payable within fifteen years, and bearing interest at a rate slightly above that which the Government paid on the Victory Loan, would appear to be reasonable.

8. The commodities clause, the anti-pooling clause and section ten of the Clayton act should be repealed, and the Sherman anti-trust law made inapplicable to carriers subject to the interstate commerce law.

9. The power to suspend rates pending investigation should be abolished.

10. Carriers should be given power to exchange passenger transportation for advertising in periodicals. The practice of barter should be recognized to be as legitimate as are cash or credit transactions.

American Concrete Institute Annual Convention

THE ANNUAL CONVENTION of the American Concrete Institute was held in Atlantic City, N. J., on June 27 and 28, 1918, with headquarters at the Hotel Traymore. The Friday morning session was devoted to the presentation of committee reports on plain and reinforced concrete sewers and the treatment of concrete surfaces. On Friday afternoon the members of the Institute attended the session of the American Society for Testing Materials on Ceramics, Lime and Road Materials. On Friday evening a joint meeting of the two societies was held, the session being taken up with committee reports and papers dealing with concrete and gypsum.

Three sessions were held on Saturday, the principal feature of interest to railway men being the paper on Concrete Railroad Track, presented by A. C. Irwin. The report of the Committee on Reinforced Concrete Highway Bridges and Culverts, A. B. Cohen, chairman, while devoted principally to the small highway culverts, developed some very interesting information as to types and design of highway bridges spanning over railway tracks.

Orders of the Regional Directors

VIOLATION OF HOURS OF SERVICE LAW.—Supplement 1 to Order 30 of the Southwestern regional director outlines the plan of the Interstate Commerce Commission relative to administering the 16-hour service law and suggests distributing copies of a letter signed by Clyde B. Aitchison, chairman of the Interstate Commerce Commission under date of June 13, relative to the intention of the Commission to prosecute individual officers and employees responsible for violations of this law.

Western Union Bills Against Railroads.—Order 216 canceling Order 205 of the Southwestern regional director quotes a letter from E. Marvin Underwood, general solicitor, containing an opinion from Commissioner Roper relative to the application of the tax on telegraph messages to messages transmitted under contract between telegraph companies and carriers under Federal control. The general conclusion reached by Commissioner Roper is that telegraph messages directly connected with the operation of railroads under Federal control are not subject to tax. The Northwestern regional director has issued a similar order—Supplement 3 to Circular 59.

Locomotive Maintenance Material.—Northwestern Regional Purchasing Committee Circular 68 states that many locomotives heretofore used on roads other than those to which they belong are now being returned to the owning road and that these locomotives were provided a supply of material for their maintenance peculiar to the individual engine by the using road. It is directed that this material be utilized in lieu of the purchase or manufacture of new material wherever possible.

Deferred Work in 1919 *Carryover Budget.*—Supplement 8 to Circular 25 of the Northwestern regional director outlines instructions for the handling of work reported as discontinued or deferred in the 1919 carryover budget.

Repair of Box and Refrigerator Cars.—Supplement 15 to Circular 70 of the Northwestern regional director contains instructions for the repairing of box and refrigerator cars. Car repairing forces are to be at once put on a 48-hour basis at all points where reduction has been made below that figure. Repairers who have been furloughed are to be returned to service and, where necessary, forces will be increased. After the completion of the cars now in the shops, the rebuilding of box cars of 60,000 lb. capacity or less will be discontinued until the bad order cars on hand have been repaired. The Southwestern regional director has issued similar instructions in Order 215.

Passenger Cars.—The Northwestern regional director, file 119-1-66, outlines a plan for increasing the available passenger equipment. The arrangements suggested include the withdrawal from shops or from storage of all coaches; and that no coaches be shopped during this period that are in a safe condition for service. Coaches assigned to troop movement should not be used for other purposes except by permission and the return movement of these coaches must be expedited.

Floor Racks for Refrigerator Cars.—The Northwestern regional director, file 16-1-65, states that Division of Operation, Circular CS43, has been withdrawn insofar as it applies to floor racks for refrigerator cars, and that authority should be received from the Division of Capital Expenditures before ordering material or beginning the application of floor racks in refrigerator cars not now equipped with them.

The Firemen, at their national convention, are considering a resolution to establish on a large scale co-operative stores for the benefit of all the railroad brotherhoods. The stores will be financed by sales of stock to union members.

The Wanton Destruction of Railways by the Germans*

Much More Than Required by Military Necessity; Varied with Speed at Which Enemy Retired

Translated by P. O. Buttrick

EVERYONE KNOWS THAT IN A BATTLE, a railroad line, be it on an embankment or in a cut, is always used by the infantry as a line of intrenchment or a shelter, that the rails are always employed to cover the abris (dug-out) and observation posts and that the yards and stations are always targets for the artillery and for bomb-dropping aeroplanes.

In most of the territory occupied by the Germans, the destruction has been much more comprehensive than this, and by their direct wish and action has been of a durable character.

It is good military practice for an army in retreat to destroy before the advancing enemy all lines of communications so as to impede his progress. The object should be to cause destruction of such a nature as momentarily to prevent military traffic. Rules for this are promulgated in our military engineering regulations. These covered such cases as the exploding of petards (light explosive cartridges) at certain distances along the rails and the cutting of bridges by the destruction of an arch in their middle. In fact, we have practiced such destruction where we had the occasion, for example, at Dannemarie on August 24, 1914.

The destruction practiced by the Germans was not, however, of this nature, but was carried out according to a deliberate plan, to ruin methodically the industrial regions of France occupied by them. This has been proved beyond doubt by the documents of the German General Staff in possession of the French Ministre of Finances and presented to the Interallied War Council.

The French Ministre of Public Works has stated in a report to the Senate, that there was destroyed a total of 5,600 kilometres (approximately 3,500 miles) of single track; 2,900 kilometres (approximately 1,800 miles) of narrow gage and local (as apart from main lines) track; 1,500 bridges more than 4 meters long (approximately 12 feet) and 12 tunnels.

On the lines of the North Railroad (Chemin de Fer du Nord) which runs through the sections where the fluctuations of the battle line were the greatest and the fighting the most severe (the Somme, Picardy and Flanders) 1,966 kilometres (approximately 1,250 miles) of line have been destroyed, representing a length of 2,950 kilometres (approximately 1,850 miles) of single track; 250 stations have been razed (not counting these destroyed by aeroplanes or artillery fire in regions not occupied by the Germans); all the bridges, culverts, tunnels, etc., have been destroyed, from the great bridges down to culverts of only 60 centimeters (less than 3 feet) span. In all, 860 bridges or culverts of a span greater than 4 meters and 320 of less than 4 meters have been dynamited. In addition to which 6 great viaducts and 5 tunnels have been destroyed.

An example will give an idea of the ferocity of the Germans in this destruction; on the line from d'Anor to Aulnoye (33 kilometres or approximately 26 miles) part of the line from Lille to Valenciennes, 24 works have been destroyed, 2 slightly damaged, and only a single one left intact. The destruction has not been confined to the line, and the right of way, but all the accessories of the yards and stations have also been systematically destroyed, such as signals, water towers, loading cranes and switch towers. (Practically every French railroad yard, even to the smallest, is equipped with hand or automatic loading cranes.—Translator) The switch towers were particularly marked for destruction. On these same Nord lines, there have been counted as destroyed: 1,000 hydraulic cranes, 150 switch towers, 5,400 signals and 15,500 kilometres (approximately 9,700 miles) of telegraph lines. All the buildings of the yards and stations such as waiting-rooms, store-houses for freight and railroad materials and workshops were blown up. (A more serious loss than would be the case in America, due to the fact that in France, practically all these buildings, even to the smallest, are of stone.—Translator). A detail which makes certain that the intention was to ruin everything is that the shelter houses of the watchmen at the grade crossings were demolished. These buildings could not possibly under any condition have any military value.

On the lines of the Eastern Railroad (Chemin de Fer de l'Est) where the fighting was less intense, and underwent less fluctuation, the destruction was less. The length of single trackage absolutely destroyed did not exceed 310 kilometres (approximately 195 miles) that which underwent great damage amounted to 1,475 kilometres (approximately 920 miles) but this damage manifested itself particularly in the neighborhood of the bridges, culverts, etc. Since the region traversed by the Eastern Railroad is somewhat more rugged than that traversed by the Northern Railroad, their destruction amounts to more. Where great viaducts, such as those of the Meuse in the Ardennes, are destroyed, no temporary restoration of the line is possible. This is particularly true of the line from Verdun to Givet which follows this river. There, all the bridges and other works were destroyed. From Bazeilles, near Sedan to Givet, that is to say in that part of the Meuse valley, where its walls are steepest, over a line about 80 kilometres (50 miles) in length, there were destroyed not less than 26 stone bridges, among which were 11 viaducts of more than 30 meters (approximately 100 ft.) span; 12 steel bridges and 2 tunnels. It is naturally the same in Belgium for the valley of the Sambre on the traverse of the rocky hills there. The destruction carried out in the mountains of the Ardennes (just north of the Argonne) which contain many great engineering works and through which pass the great international lines from France into Germany, has created between northern France and Lorraine, an intraversible zone. This barrier will be sooner or later overcome, but at present, one must go around its ends. The result is that although in time of peace, the lines of communication between France and the Rhine valley were numerous and rapid; they are now reduced to the single line which passes by way of Nancy.

On the lines of the Eastern Railroad, a total of about 150 bridges or culverts were destroyed. Eight tunnels were similarly destroyed, and for 2 others, the repairs made by the Germans following their destruction in 1914 give room only for a single track. Of the 8 tunnels totally destroyed, four, those near Liart, are in a soil difficult to work and their reconstruction will require a long time. The signals, the water tanks, the station buildings, the telegraph lines, in a word all the equipment of the yards and stations, were destroyed.

*From time to time the general staff of the French army issues bulletins for free circulation in its ranks. These bulletins deal with military matters or are of an instructive nature concerning certain aspects of French public affairs. This article is a translation of such a bulletin (93 new series, issued March 2, 1919), which was made by an American engineer who is now a lieutenant in a French artillery regiment.

There have been counted 3,200 signals, 100 station buildings and 150 grade crossing watchmen's shelters dynamited.

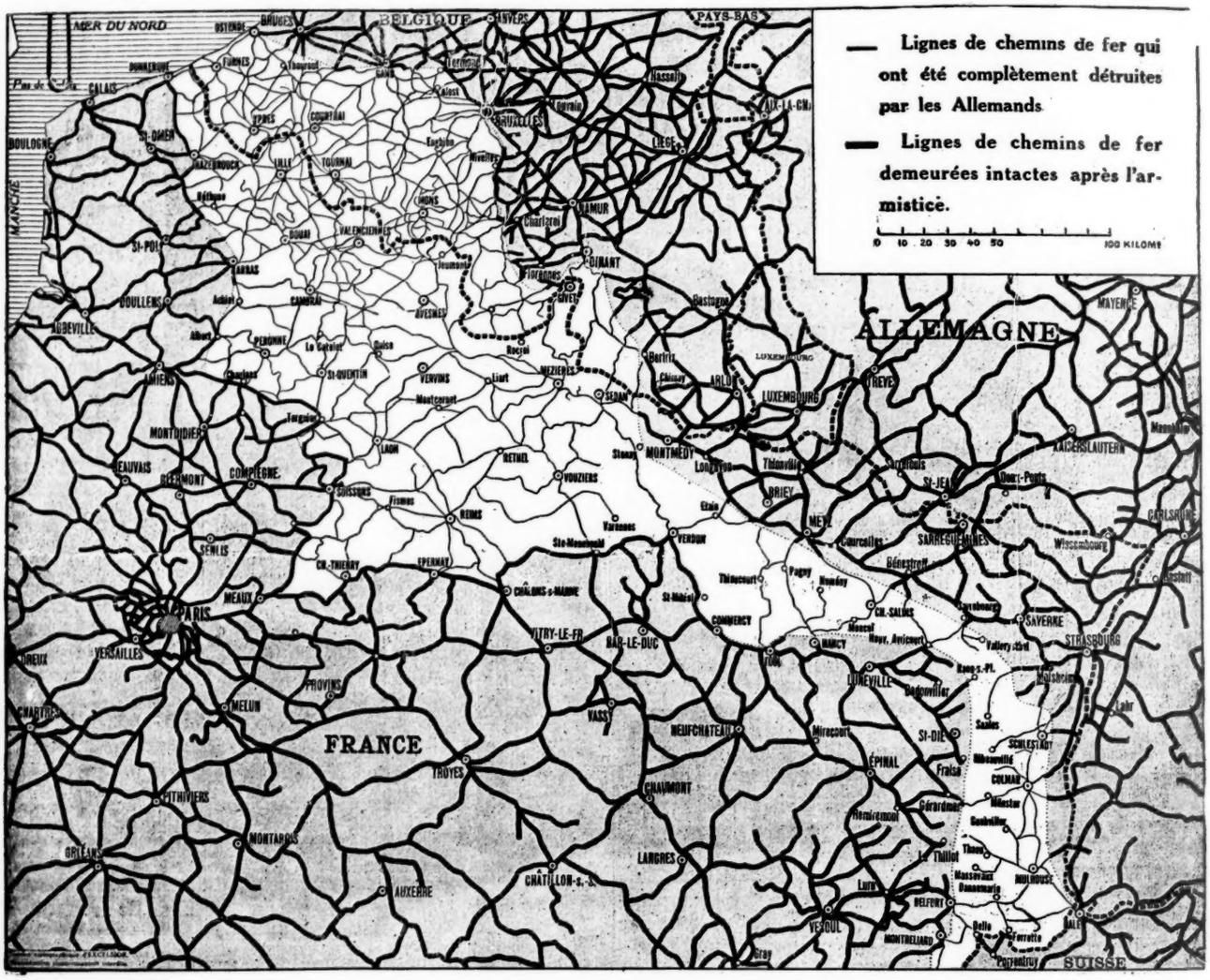
Processes of Destruction

The mere enumeration of such destruction as that of watchmen's houses, station buildings, proves that the Germans had some other object in view than a purely military one. We find still more proof in the methods with which they have conducted this destruction.

Not only have portions of the rails been removed, such as would have been sufficient to prevent the pursuit of an enemy. but often the entire track has been removed or destroyed. To separate the rails from the ties, the Boches used a special torpedoes where any two rails remained joined together, after the charrue had passed. This apparatus was employed principally on the lines of the Northern railroad. On the lines of the Eastern, the Germans confined themselves largely to torpedoing every rail joint.

To destroy the embankments, mines or torpedoes were placed from 50 to 200 metres (approximately 160 to 650 feet) apart with an explosive charge varying from 50 to 100 kilogrammes (25 to 50 lbs.). Holes capable of containing 2,000 cubic meters of material have been found in such places, where, of course, all the embankments have been destroyed clear down to the natural soil.

Toward the end of the war, when the Germans did not



Railway Lines Destroyed in France and Belgium

A map reproduced from the French newspaper Excelsior. As explained by the legend, the light lines show railroads completely destroyed by the Germans, and the heavy lines those that remained intact after the signing of the armistice.

apparatus known as a *"charrue"* (literally translated a plow —Translator). It was composed of 2 rails 6 meters long, bolted close together at one of the ends, the two other ends being separated to form a V, but united by means of two other completely united curved rails. This machine was hitched to the tender of a locomotive by means of a chain attached to the point of the V. The curved rail was then placed under the rails of the track, but above the ties by means of the removal of two rail joints. The engine then started and the charrue ripped up the track as it progressed. During this operation, a crew of men followed the locomotive and placed have time to prepare special mines, nor to carry away their artillery munitions, they made the latter up into bundles which they heaped together loosely along the tracks, in the culverts and the cellars to the stations and then exploded them.

The bridges were not simply blown out in their centre—which would have been sufficient to interrupt our pursuit for the time necessary for the Boches to retire to another defensive position—but the charges of explosive were placed beside the abutments in such a manner as to overthrow not only the masonry, but also the solid earth—natural or arti-

ficial—which supported the masonry and thus to enlarge the opening necessary to be spanned by the bridge. The great size of the charges used (1,000 to 2,000 kilogrammes or 500 to 1,000 lb.) was such that frequently the length of the span was doubled. On the lines of the Northern Railroad, culverts of 60 centimetres (less than 1 yard) were blown up with mines of such strength that the present openings have spans of 13 metres (40 feet).

The tunnels were similarly destroyed, not alone in the view to a momentary interruption, but rather in a manner to close them permanently. Such is the case of the ones at Perthes near Rethel (On one of the great international lines from France into Germany—Translator.) and at the Manse near Challeranges. They were destroyed with such a lavishness of explosives that the soil is pulverized, clear to the surface above the arch. At Perthes, there has already been removed at the two extremities 70,000 cubic metres (87,500 cubic yards more or less) of material, without having yet reached any portion of the vault still standing. At Manse, it is estimated that 175,000 to 200,000 cubic meters will have to be removed before passage can re-established.

Another scheme adopted by the Germans was to leave mines with slow acting fuses which would not cause an explosion until long after the line was again in French possession. On the lines of the Northern Railroad alone, there have been counted 250 mines with delayed fuses, most of which did not explode for several weeks or even several months, after the Germans abandoned the lines. Certain places were mined so as to be destroyed twice or even three times. For example, the Boches on leaving blew up a bridge knowing that the first care of the French would be to re-establish a passage. After the explosion, they would plant a mine with a delayed action fuse, which would explode in the same place a dozen days later. After the explosion of the second one, they figured that the French would consider it as finished this time, and recommence the work in a permanent fashion. So they placed also a second mine with delayed action fuse to explode a month later. The positions of these mines were calculated so as to enlarge each time the mine crater. This system was notably employed at a bridge at Roye, but the French were able to prevent the last explosion. Another stratagem frequently employed by the Germans was to place a mine with a retard action fuse in the crater of one already exploded. They counted upon this not only to multiply the number of victims, but also to cause a state of demoralization such that no one would dare to go near the lines.

Difficulties of Work of Reconstruction

From the extent of this destruction, one may deduce the size and difficulties of the reconstruction of these lines. It is necessary in effect to reconstruct the track *"à l'avancement"* in the same manner as were built the great trunk lines in America or the Transsiberian Railway, that is to say as one proceeds in countries where there does not exist any other means of transportation, the rails already laid, serving to bring forward the materials for the continuation of the line. This is especially true, since the highways are still in too poor a state to permit the bringing up of the heavy materials, even if there were automobile trucks powerful enough to transport the heavy steel girders, necessary for the bridges and viaducts at certain points.

The work of laying the track is not all. Everyone knows that a railroad cannot function without coal and water stations at different points along the line. There is also to be considered the replacing of the signal system. The yards at station at Valenciennes alone, had 272 signals of various kinds, all of which were destroyed and whose replacing is a long and delicate operation.

Supposing the track re-established and the yards re-equipped, can the traffic be easily re-opened? No. There remains to be reconstructed the buildings for sheltering merchandise and protecting it against pillage and for lodging the personnel.

Because of this destruction, certain localities have been and still are completely isolated. When traffic has not been entirely prevented it has been forced to detour. It is thus that all the traffic from France toward Alsace-Lorraine and the Rhine valley, cared for before the war by seven lines, has been reduced to a single indirect line by way of Nancy. The great trunk line from Paris to Metz was destroyed for a great distance in the Argonne and at Verdun, and it will not permit of a heavy traffic for a long time after its re-establishment.

The great viaduct at Dannemarie in Alsace, between Belfort and Mulhouse has not yet been re-established and has been replaced by a detour over an unstable soil which in wet weather can carry only light trains.

The New England District Director

JAMES H. HUSTIS has resigned as district director, New England district, United States Railroad Administration, effective July 1, and has been succeeded by Percy R. Todd, who has been acting as assistant to the district director.

The New England district consists of all New England railroads under federal control, including such parts of those roads as extend into New York state and into Canada, and Mr. Hustis was appointed to the position when it was created June 10 of last year.

Percy R. Todd

When asked as to the significance of the resignation Mr. Hustis said that the probable return of the railroads to private operation on December 31 placed on him a special obligation in connection with the Boston & Maine, of which he has continued to be the receiver. There are many details to be arranged for in connection with the return of the railroads to their owners, as well as in preparing for their organization after their return, and Mr. Hustis will give his entire time to this work as applied to the Boston & Maine.

Percy R. Todd was formerly president of the Bangor & Aroostook. He was born December 4, 1859, at Toronto, Ont., and attended the Collegiate Institute at Ottawa, Ont. He began railroad work as a clerk and telegraph operator on the St. Lawrence & Ottawa, now part of the Canadian Pacific. In 1875 he became the Canadian agent of the Ogdensburg & Lake Champlain. In 1882 he was made general traveling agent of the National Dispatch Line with office at Chicago, and three years later became commercial agent of the New York, West Shore & Buffalo. In December, 1885, he was appointed chief clerk in the general freight department at New York, and a year later was made general freight and passenger agent of the Canadian Atlantic. In 1889 he was made general freight agent of the West Shore and in 1892 was promoted to traffic manager. In 1901 he was elected second vice-president of the New York, New Haven & Hartford and two years later was elected first vice-president. He went to the Bangor & Aroostook as vice-president in 1907 and in 1913 was elected president.

American Society For Testing Materials

A Brief Report of the Proceedings of the Annual Meeting Held Last Week in Atlantic City, N. J.

THE TWENTY-SECOND ANNUAL MEETING of the American Society for Testing Materials was held at the Hotel Traymore, Atlantic City, N. J., June 24 to 27, 1919. The evening session of the opening day was devoted to the annual address by the president, Guilliam H. Clamer, and a memorial session in honor of the memory of Dr. Edgar Marburg, the secretary-treasurer of the society from 1902 until his death on June 27, 1918. The following is a brief abstract of some of the many reports and papers presented at the meeting which are of particular interest to railroad men.

Committee on Steel

The committee on steel made a number of recommendations in reference to changes in both standard and tentative standard specification and proposed a new tentative standard specification for plates for forge welding. Revisions were proposed in the existing standard specifications for open-hearth steel girder and high tie rails by which the present drop test requirements would be replaced by a ball impression test. Sections 7 to 10, inclusive, of the present specifications specifying drop tests requirements were recommended to be omitted and replaced by the following sections 7 to 9 renumbering the remaining sections of the specifications.

7. (a) Four representative sections of rail from each melt shall be selected by the inspector as test specimens.
(b) Excess scale on the head of the section shall be carefully removed.
8. (a) The head of each specimen shall be subjected to a pressure of 50 net tons (100,000 lb.) for a period of 15 sec., applied through a ball ¾ in. in diameter.
(b) The average depth of impression obtained on the four specimens shall not be more than 3.8 mm. for class A rails, nor more than 3.6 mm. for class B rails.
9. If the average of the impression tests from any melt fails to conform to the requirements specified in Section 8 (b), the manufacturer may, at his option test each rail from such melt by making an impression test on the web, as described in Section 8 (a). Rails so tested which conform to the requirements as to depth of impression specified in Section 8 (b) shall be accepted.

The tentative specifications for steel tie plates (A67-18T) and for low carbon steel track bolts (A76-18T) were continued as tentative for another year without change.

Specifications For Plates For Forge Welding

The chairman of the Tank Car Committee of the Master Car Builders' Association, A. W. Gibbs, requested Committee A-1 to issue a specification for forge-welding plates suitable especially for tank cars.

This matter was referred to a sub-committee and initial work taken up with particular reference to the M. C. B. Class V tank car.* The specifications for this car call for a bursting pressure, based on the lowest tensile strength of the plates, of not less than 960 lb. per sq. in., and require that all seams shall be welded. The material specified is steel, complying with the American Society for Testing Materials specifications for boiler plate steel, flange quality, with the lowest carbon content consistent with the strength prescribed for the purpose of welding.

The requirements of the American Society for Testing Materials specifications for boiler steel, flange quality (serial designation: A30-18) are:

Chemical Composition.

Carbon, per cent	.....
Manganese, per cent	0.30—0.60
Phosphorus, per cent { Acid	Not over 0.05
Phosphorus, per cent { Basic	Not over 0.04
Sulphur, per cent	Not over 0.05

No increase allowed for check analysis.

*See M. C. B. Proceedings, 1918, page 903, for the Class V tank car specifications. This car is intended for the transportation of liquid products, whose properties are such as to involve danger of loss of life in the event of any leakage or rupture of the tank.

Physical Properties

Tensile strength, lb. per sq in.	55,000-65,000
Yield point, lb. per sq. in.	0.5 tensile strength
Elongation in 8 in. per cent	1,500,000 / Tensile strength

Reduction in elongation allowed for increased thickness. There apparently was some objection on the part of the fabricators to using steel of such high tensile strength for welding; hence it was proposed that a softer grade should be specified. The following specifications for plates for forge welding were recommended to be adopted as tentative.

Chemical Properties

The steel shall conform to the following requirements as to chemical composition:

Carbon	Not over 0.18 per cent
Manganese	0.30-0.60 per cent
Phosphorus	Not over 0.04 per cent
Sulphur	Not over 0.05 per cent

Physical Properties

The material shall conform to the following minimum requirements as to tensile properties:

Tensile strength lb. per sq. in. { Plates ¾ in. or under in thickness	48,000
Tensile strength lb. per sq. in. { Plates over ¾ in. in thickness	45,000
Yield point, lb. per sq. in.	0.5 tensile strength
Elongation in 8 in. per cent	1,500,000 / Tensile strength

The sub-committee was advised by Mr. Gibbs that "the question of tensile strength is subordinate to that of the welding qualities, for if the chemistry required involves low tensile strength, the specified bursting strength can be obtained by increasing the thickness of the plates." The opinion seems to be unanimous that a soft steel is necessary, the general aim being for a carbon content of from 0.08 to 0.12 per cent for satisfactory welding properties. Having fixed the maximum carbon at 0.18 per cent, and bearing in mind the lower values which are worked to, it was seen that the tensile strength of thick plates would surely drop below 48,000 lb. per sq. in., but that the lowest carbons in the thinner plates would probably not run the tensile strength below 48,000 lb. Therefore, in order to permit designers of welded tanks of this figure, the tensile strengths have been specified at 48,000 lb. for plates ¾-in. or under and 45,000 lb. for plates over ¾-in. in thickness.

Other Committees

The Committee on Non-Ferrous Metals and Alloys recommended that the present tentative specifications for bronze bearing metals for turntables and movable railroad bridges be continued as tentative. The question of revision of the tentative specifications for non-ferrous alloys for railway equipment was considered but since the question is being taken up by the government it was considered unwise to attempt any change at present and the committee recommended that these specifications be continued as tentative.

On Malleable Castings

During the past year criticisms were made of the tentative specification covering malleable castings for railroad, motor vehicle, agricultural implements and general machinery purposes. One was that the castings do not show as high tensile strength and elongations as the test bars. The other was that iron made to these specifications was hard to machine. A sub-committee was appointed to obtain data on the relation of tests from bars and from castings, and to report their findings. The same sub-committee was asked to look

into the necessity of separate specifications for malleable iron where good machining qualities are required.

Cements for Producing Quick-Hardening Concrete

By P. H. Bates

In the course of the investigations which the Pittsburgh branch of the Bureau of Standards has been conducting dealing with the various problems relating to Portland cement, there have been made a number of cements which are characterized by a very high early strength. This is developed when the cements are used either as mortars or concretes. These cements have been made in a manner differing in no wise from that used in the manufacture of Portland cement. However, the composition of the materials entering into their manufacture was decidedly different, limestone and calcined alumina having been used in some of the raw mixes, and in others the alumina was replaced in part by kaolin or bauxite in order to determine the effect of impurities on their general properties. While such materials have been the subject of research by others, their property of developing very high early strengths is not generally known. It is believed that the data presented in this paper, especially that dealing with the concrete, are the first of their kind ever presented.

The data dealing with the aluminates are augmented by some obtained in making concrete from "Sorel cement" which, as is generally known, is light calcined magnesite gaged with magnesium chloride. As it obtains the greater part of its strength within 24 hr. and as this strength equals that obtained by a Portland cement at the end of two or three weeks, the possibility of using it becomes very attractive.

The fact that magnesium oxide when mixed with a solution of magnesium chloride will harden was possibly first known by Sorel in 1853. From him it has at least taken its more common name. At the present time this cement is used in rather large quantities for making a resilient flooring which is usually referred to as "composition flooring." When so used the aggregate is composed of asbestos fiber, sawdust, inert finely ground filler as sand and coloring matter. This flooring is widely used in a monolithic form in office buildings, passenger and subway cars and interior ship decks.

TABLE COMPARISON OF COMPRESSIVE STRENGTHS OF SOREL AND PORTLAND-CEMENT CONCRETES

6 by 12-in. Cylinders. Strength in Pounds per Square Inch

Proportions by volume	Percentage of cement by weight: Portland	MgO.	24 hours: Portland	MgO.	48 hours: Portland	MgO.	7 days: Portland	MgO.
GRAVEL AGGREGATE								
1 : 0.5 : 1.5	33.3	20.3	....	1740	1570	3490	2965	2910
1 : 1.0 : 3.0	20.0	11.3	....	1705	1115	2260	2020	2850
1 : 1.5 : 4.5	14.3	7.8	....	1755	680	2145	1430	2240
*1 : 1.5 : 4.5	....	14.3	....	2880	....	3315	....	2720
LIMESTONE AGGREGATE								
1 : ⅔ : 1⅓	35.2	21.8	....	2985	2260	3990	3930	4320
1 : 1⅓ : 2⅔	21.4	12.2	....	1940	1340	2805	2990	2970
1 : 2 : 4	15.4	8.5	....	1935	655	2330	1755	2480
*1 : 2 : 4	....	15.4	....	3270	....	4020	....	4320
COARSE SAND AGGREGATE								
1 : 0.5 : 1.5	34.0	20.8	....	2060	1715	2570	3270	2735
1 : 1.0 : 3.0	20.6	11.6	....	1910	545	2225	1635	2430
1 : 1.5 : 4.5	14.7	8.0	....	935	325	1695	985	1870
*1 : 1.5 : 4.5	....	14.7	....	2555	....	3260	....	3190

Note—The percentage by weight of MgO in 1 : 0.5 : 1.5 and 1 : ⅔ : 1⅓ is but very little greater than the percentage by weight of Portland cement in 1 : 1.0 : 3.0 and 1 : 1⅓ : 2⅔, respectively.

*MgO proportioned by weight, making weight percentage of MgO equal weight percentage Portland cement in 1 : 1.5 : 4.5 and 1 : 2 : 4.

Recently a mortar very similar in nature to the above, excepting the omission of the fibrous material, has been rather successfully used as a stucco.

The Table shows the strength of the concrete made from this mixed oxide and also the compressive strength developed by a Portland-cement concrete using the same proportions of the same aggregates. Notwithstanding the fact that the specific gravity of the magnesia is very close to that of Portland cement (3.08 for the magnesia and 3.12 for the cement), the volume occupied by the same weight of the two differs very materially.

The results show that the Sorel-cement concretes, with but two exceptions, have a strength at 48 hr. greater than that obtained by the use of Portland cement in 7 days. However, there is in general but little increase in the strength of the former between the 48-hr. period and the 7-day period.

Attention should be called to the difference in the manner in which the hardening of the two concretes takes place. In a Portland-cement concrete, the cement hardens by the action of the added water. During the process of hardening it is immersed in an atmosphere containing in a greater or less degree one of the essential elements of the process, that is, water, either as a liquid or vapor. On the other hand, in the Sorel-cement concrete the hardening takes place as a result of the action of the chloride on the oxide.

While the results do show the lack of proper proportioning of both the magnesia and the chloride, yet these poorly proportioned concretes show in 24 hr. as high strengths as the more properly proportioned Portland-cement concretes show in seven days. Another point should be remembered in regard to these Sorel-cement concretes, that is, they cannot be frozen. Temperatures below freezing will retard the hardening to a degree, but the freezing point of the solution is so low that no care need be taken to prevent damage from low temperatures.

The conclusion with respect to the aluminates of lime, even when they contain such amounts of impurities as 10 per cent silica and 3 per cent iron oxide, is that they constitute a material which is a very valuable cementing medium when gaged with water. This particular value lies in the high early strengths which they develop. The greater the amount of the alumina present, as an aluminate of lime, the greater will be the early strength. Under certain conditions of curing there is a marked increase of strength with age, but this does not extend over a very long period of time. It also appears that if the concrete is subjected to an excess of water during curing there will be a decrease in strength. Such amounts of moisture as are usually present in the air do not materially affect the strength. It appears, therefore, that these cements might be of considerable value for certain special uses, where the principal requisite would be quick hardening.

Deep Etchings of Rails and Forgings

By F. M. Waring and K. E. Hofammann

This paper presents the results of some deep etchings with hot acid on both new and old rails and forgings. Under this process defects in the steel, having the appearance of cracks, have been developed to visibility. These defects could not be found with light etching and apparently are caused by actual cracks in the steel extending through solid crystals as well as following the crystallin boundaries.

A slab taken from a rail which had developed 12 transverse fissures when broken under the drop test was etched for two hours in a hot solution of 9 parts hydrochloric acid, 3 parts sulfuric acid and 1 part water. The action of the acid opened up both transverse and longitudinal fissures whose existence could not be detected under the light etching to which this slab had previously been subjected. This specimen was from an old rail which had been in the track for about five years, and the entire heat, consisting of 61 rails, had been removed on account of a number of failures from transverse fissures. Similar treatment of a slab from one of the rails in the same heat which did not contain any transverse fissures showed the section entirely free from any

of the cavities which were opened up in the specimen mentioned above.

This investigation by means of deep etching with hot acid has developed the existence of interior defects in rail heads, which defects appear to be more frequent in rails that have developed a number of transverse fissures than in others which had only a few or no such fissures. They have also been found to exist in new rails which have not been in the track. It appears that these concealed defects cannot be detected by the usual methods of investigation and tests, or even by the usual method of etching.

Microscopical and chemical examination of the sections containing these defects have not, so far, developed the existence of any inclusions between the faces of the cracks and there is no apparent difference in the microstructure of the steel in these locations which would account for the action of the acid. After one of these cracks has been lightly developed and the surface polished and examined under the microscope the defect has been found to extend through the crystals, as well as following the boundary lines.

Discussion

This paper brought on a lively discussion the consensus of opinion being that the cause of the cracks must be sought in the mill during some stage of the fabrication of the material. H. J. Force, chemist for the Delaware, Lackawanna & Western drew attention to the variation in rails of the same heat, some of which develop cracks or transverse fissures while others do not. He suggested that the first rails of a heat were likely to be defective, if any of the heat were, due to the fact that the steel had had less time in the ladle for reaction and purification.

Proportioning Pit Run Gravel for Concrete

By R. W. Crum

The material considered in this paper is pit-run gravel, to be used without change as it comes from the pit, the problem being to establish some relation between grading and the amount of cement such that, for mixtures of the same plastic consistency, concretes of equivalent strength could be designed. The principal conclusion is that the grading of pit-run gravel may be measured by the ratio of fine aggregate to total aggregate (that is, percentage of fine aggregate in total) and by the weight per cubic foot of the material, measured loose. For purposes of commercial convenience the dividing line between fine and coarse aggregates is taken on the common No. 4 sieve. The analysis results in the development of several diagrams for use in proportioning pit-run gravel for various classes of concrete on the basis of the weights of the aggregates in terms of percentages of sand in the aggregates.

Other Business

Among other things considered at the meeting were the topical discussion on magnetic analysis in which Dr. P. H. Dudley presented a paper on Magnetic Surveys on New and Failed Rails; a paper presenting Theoretical Studies of the Surface Method of Proportioning as Applied to Concrete by R. B. Young, which supplements the papers on the same subject presented by L. N. Edwards at the annual meetings of 1917 and 1918.

The following officers were elected for the ensuing year: President, J. A. Capp; vice-president, C. D. Young; for members of the executive committee, Ernest Ashton, H. F. Moore, C. F. W. Rys, and Admiral D. W. Taylor.

The laws to return the telegraph and telephone lines to their owners (July 31) and to abolish the daylight saving law next October, have both been sent to the President.

The Permanent Solution of the Railroad Problem.*

By Walker D. Hines

Director General of Railroads

There is a great deal of discussion amout the merits of private management as compared with interference by the government in the management, and there is a disposition to forget what sort of private management was left in this country before government control began, and to imagine that there was a form of private management free from government interference. The fact, however, is quite otherwise, and we have made great strides in this country toward a condition where the government was directing in a most effective way some of the most vital things with which railroad management had to deal.

We have got to a condition where private management was management only in a partial sense, and where already there was government management through the control which the government had for some years exercised over the railroads in determining the prices charged for the commodity which they had to sell, namely, railroad transportation. In some states, the rates were fixed absolutely by the state authorities. In other states they could only be fixed by the railroad companies with the consent of the state authorities. In practically all states the railroad companies' rates were subject to change by the state authorities. As to the interstate rates, which constitute the great bulk of the business of the railroads, all the rates were subject to the control of the Interstate Commerce Commission, and by a statute passed in 1917, no increase in rate could be made until January, 1920, without the prior consent of the commission. So that we had a situation in this country where prior management had little if anything to do with the rates to be charged. That already, was a matter of public management in a broad sense.

As to service, the states had begun a good many years ago to determine what should be done in the way of service. They prescribed the passenger trains which should be run, the sort of station accommodations which would be afforded. They had begun to make provisions about the operation of freight trains.

Part of these things were for the purpose of affording the public a satisfactory service, and part of them were for the purpose of protecting labor through giving it suitable working conditions. But in these matters affecting service, the state governments for years had taken an active part in the railroad management. So that even there the theory of private management was a theory only.

As to interstate matters the government had not gone so far as to determine service, although it had virtually determined what should be done in safety operation, which had been taken out of the hands virtually of the railroad companies. But we were just seeing the beginning of the government determinations of what should be done in the way of service. We were headed in the direction of a progressively increasing participation by the government in the settling of problems of service, so that we had not only in reference to the rates practically entirely taken it out of the hands of the railroad management, but we had seen the service in a general way taken out of the hands of the railroad management likewise.

As to wages the situation was exceedingly difficult. There were no satisfactory tribunals to deal with the matter. There had been, to be sure, an increasing appreciation of the fact that labor not only asserts but is entitled to a voice in determining these matters which are of fundamental importance

*From an address before the New England Bankers Association, at Swampscott, Mass., on June 21, 1919.

to labor. We had no machinery with which to deal with it, and yet the state governments were dealing with the matter of working conditions in all sorts of ways; the courts had been called on to deal with the matter of wages through the passage of the Adamson act on account of the failure of the machinery to settle that matter, and there again we were headed in the direction where the government must assert itself in the determining of these problems; and therefore must take over to a large extent these problems, out of the hands of private management.

When we remember those matters it will help us to remember that private management does not mean exactly what it says. At the beginning of federal control it was already seriously qualified and the qualifications were becoming more serious. They were simply an expression of the growing appreciation that the interests involved were not merely the interest of the owners of the railroads, but the interests of the public in service and the interests of labor in the pay which it received and the conditions under which work was performed.

When we remember these matters it will help us to realize that it can never be a full private management. That we must find some form of management of the railroads which would go to reflect what the public will insist on in the matter of public control, as to what it pays for the service, as to what service it gets, and will reflect what labor may rightfully insist on, that it is entitled to a voice in determining the wages it shall get and the conditions under which it shall work. So that is our problem, and when we look at it in that way we can see that it is largely a difference in form rather than in substance, between one form of government regulation and another form of government regulation, because in one way or another the government must regulate this matter to protect the interest of all the parties concerned; not merely the owners, but the general public and also of labor.

I have had occasion to give years of study to these problems from the standpoint of private management and I have had occasion to give nearly two years of study to it from the standpoint of the public, and I want to give some of my impressions about public regulation under private management; as to what would be the proper way to solve these problems for the future. We know the old form of private management and the old form of public regulation did not seem to work well together. For years there had been increasing embarrassment on the part of the railroad companies generally in raising money necessary to meet public service and needed for improvements that seemed to be a progressive matter and was getting more and more embarrassing to the railroads that were less able to induce anybody to put more money into the railroads; because the railroads were not able to issue new stock and sell it at par, that was because everybody was afraid of the stock and the railroads were having trouble borrowing the money to go into the property and were having to borrow new money for that purpose. That meant that the debt was increasing out of proportion to the total assets and that means that the margin of safety over and above what went into it was diminishing, so that the situation was that the railroads were constantly having to borrow more money in order to build new lines, new terminals and to make the needed improvements and that the margin of safety was diminishing and gradually being impaired, resulting in the railroads having to pay a higher rate of interest and that situation meant that the railroad enterprise of the country was headed toward failure. Then federal control came along and took charge of the situation.

How are we going to prevent a re-currence of that situation which existed when federal control began? I will try to give you in a few words the situation under the old form of public regulation of railroads. In the first place there was a general rule by which regulation was to be conducted on the general notion of a fair return on a fair value of the railroad property, but the fair value was not ascertained and the fair return was not definite. Every man was entitled to his own opinion on each of these and the result was that it was almost impossible for any tribunal to agree as to how the matter ought to be settled. And the old fight would start over again and all of the plausible arguments would be made. That led to the greatest uncertainty in the administration of railroad regulation.

We have in this country 181 railroads with a revenue of $1,000,000 a year each and several hundred railroads of less revenue than $1,000,000 a year each. All of these railroads, big and little, were necessary in some way to the public service, and anything that might be done in the solution of the rate or wage problems seemed to result in giving some of the railroads more than they needed, and thereby creating popular dissatisfaction and at the same time giving some railroads so much less than they needed that it was almost impossible for them to perform the public service which they were supposed to perform, and therefore, it was almost impossible to fix any rate that would reasonably meet the needs of the strong railroads and the weak railroads and failure to combine and satisfy that situation started a new agitation on both sides.

My idea is that there ought to be a definite statutory basis for the regulation, and it ought to be ascertained what the value of these properties is. There ought to be a prescribed rate return to which they are entitled, and that ought to be assured by some mandatory or statutory provision, and the rate must be so fixed as to produce that return, and beyond that, I think it ought to be provided that if an additional return shall be yielded from those rates, that a sum to be determined for that purpose is to be put back into the property for improving the property in order to keep pace with the increase in demands of business and that the money thus put into the property out of the earnings shall not be capitalized so as to further add to the value of the property. That would provide that the earnings made in excess of what was necessary to operate this property upon a standard return would be put back into the property without being capitalized. This would lead to the question of the public getting the improvements, and they would not have to pay for this exploitation without any limitation of the public having the benefit thereof.

Another thing that I would recommend would be a consolidation of the railroads of this country into a few large competitive systems, all of which shall present a fair average of railroad condition, so that regulation can be applied to them, and we will realize approximately uniform results as to all of them. I believe from 12 to 20 great railroad systems could be created in this country, each one of which would present a fair average of all the railroad conditions, and those railroad systems could be so arranged that every important city that now has competition would continue to have competition between the stronger railroads, and I believe if these things can be done, that will present a remedy.

Another feature that I want to present to you is this, as between regulation of the railroads and the management of the railroads under private ownership, that as a matter of fact, the government is in partnership with the owners of the railroad. The government furnishes the franchises, and the owners furnish the money, and those two things have to be done in partnership. My judgment is this situation ought to be met by having a government representative on the board of directors, and in this way he will come directly in contact with the interests of the private management, so that he will be familiar with the business, and the situation, and will be able to act better in connection with private management, and I think it would be well for the regulating bodies to

have some of its members on the board of directors, so that the regulating body will have in mind the business necessities of the situation, and so that the private management will come in contact with these government directors and the other members of the regulating body, and they will thereby have first hand information as to the legitimate needs of the public and the corporation. I believe these things will make public regulation of private management successful, and I believe when these things are done it will at least go far in correcting the evils, and I think if these are not done, that public regulation of private management is going to be a failure.

Railway Affairs in Congress

WASHINGTON, D. C.

HEARINGS BEFORE THE HOUSE COMMITTEE on the Cummins bill to give the Interstate Commerce Commission power to suspend the director general's rates were concluded on June 27. While Mr. Hines in his first day's testimony had discussed the bill on the assumption that Congress intended to pass it and did not oppose it, in his concluding testimony on June 26, he said he thought it would be a wrong policy to give the commission power to suspend for 10 months rates proposed by the Railroad Administration without any responsibility for substituting rates for those which it might consider unreasonable and that the time required by the commission might so delay a rate advance that the government would not get the benefit. For example, he said that if an advance should be announced in July and the commission should require two months to pass on it, the rates would not become effective until October 1; or only three months before the time set for the return of the roads.

Representative Sims asked a direct question as to whether the Railroad Administration is contemplating a further increase in rates.

"We are giving very careful consideration to that problem," replied Mr. Hines, "but have reached no conclusion."

Chairman Esch asked Mr. Hines to suggest the language of an amendment carrying out his idea that the purpose of the bill could be accomplished by a simple amendment giving the commission the right to suspend rates for a specified time less than that provided in the present law. In connection with the length of this period, Commissioner Hall of the Interstate Commerce Commission remarked that the commission had passed on the first 15 per cent case in 60 days and it was suggested that Mr. Hines and the commission confer on a proper period.

B. B. Cain and B. M. Robinson, of the American Short Line Railroad Association, suggested that the judgment clause of the bill be modified so that the director general could pay judgments out of any funds he might have, because some roads under federal control have no compensation, and that Section 1 of the control act be amended to permit the Railroad Administration to enter into contracts wih electric interurban railways. The latter was opposed by C. E. Elmquist, representing the state commissions, who declared that there was no war necessity for taking over electric lines and that the purpose was to give them the two days free per diem and the advanced rates.

Clifford Thorne, who is credited with sharing with Senator Cummins the authorship of the bill, defended it vigorously against criticism. He thought it would be a very wise policy to restore the state jurisdiction, saying that there is now pending before a district committee of the Railroad Administration a proposal to cancel the Kansas state rates. Because of the uncertainties facing business during the reconstruction period he thought there should be a delay in the return of the roads and that their guaranty should be paid out of the treasury rather than by an advance in rates which would affect shippers differently because many of them cannot pass an advance along to the consumer but must necessarily absorb it.

"The federal control law, as worded today," Mr. Thorne said, "provides that our railroads are subject to the statutory law, state and federal, and to the common law except where they may conflict with orders of the President. According to the decision of several courts, state and federal, this law has conferred upon the President legislative powers. It has made him superior to our state laws, to our federal laws, to our courts and to the United States Congress by its own act. And Mr. Hines has appeared before you requesting that the clause requiring the railroads to be subject to the law of the land except where such law conflicts with the orders of the President should be retained. I could cite to you instance after instance where this enormous power has been exercised. And the President has conferred this colossal power upon the quiet-spoken, courteous gentleman who addressed you yesterday, a gentleman who has no superior in keen, far-sighted, shrewd ability of the very highest type among all the railroad men of the United States with whom I have ever come in contact.

"No organized industry in the history of this nation ever had conferred upon it such colossal power as you have given to the organization of railroads headed by Mr. Hines, formerly of the board of directors of the Atchison, Topeka & Santa Fe, in what is known as the United States Railroad Administration. Now hasn't the war emergency ceased for the present at least, so far as the United States is concerned? And is it not time to put business back on the normal peace basis just as quickly as possible? That is what the American people want. They are begging for it.

"There is a sort of halo around the head of this man Hines. It isn't simply an ordinary crown. It is more exalted than that. Mr. Hines, sitting here in this room, a man who has spent his lifetime in railroad service and who undoubtedly expects to spend the rest of his life in the employ of railroads, has been authorized by the United States Congress and by the President to set aside acts of Congress, legislatures, and decisions of commissions and courts. I think we are pretty well agreed that it is time for crowns and halos and scepters to be put into the discard. We want that clause which says, in effect, that the laws of this country shall apply to our railroads except where such laws conflict with the orders of His Majesty, the Right Honorable Mr. Hines, formerly of the Santa Fe Railroad, stricken from the statute books.

"Not one word of this should be interpreted as a personal attack on Mr. Hines or any of his associates, to the slightest extent. It is simply a criticism of a system, which we believe is fundamentally wrong under peace conditions.

"It is of paramount importance that you immediately restore the full powers of the Interstate Commerce Commission, and of the courts, to the condition existing prior to the war. The railroads are conscious of the fact that they have only a short tenure of the supreme power you gentlemen have granted to them. During this interim of six months you may expect to see sweeping changes in rates and regulations governing transportation unless the power of review of such changes before they become effective is lodged in some disinterested tribunal."

The House committee has tentatively decided to begin hearings on general railroad legislation on July 15. Senator Cummins has not yet appointed a subcommittee to draft the railroad bill.

By a vote of 8 to 6 the Senate committee on June 26 decided to postpone action on the Poindexter long and short haul clause bill for consideration in connection with the proposed bill on general railroad legislation.

Doings of the United States Railroad Administration

New Instructions for Maintenance of Way Expenditures Issued to Regional Directors

WASHINGTON, D. C.

THE BILL APPROPRIATING AN ADDITIONAL $750,000,000 for the revolving fund of the Railroad Administration was signed by the President on June 30 in mid-ocean, having been delivered to him on board the steamship "George Washington" by a courier who had sailed from New York on another boat which met the President's ship. This means that the Railroad Administration will soon have funds to retire its certificates of indebtedness issued to railroad and equipment companies, on which they have borrowed from banks or the War Finance Corporation, and to pay the $441,000,000 balance due the railroad companies for 1918. Funds cannot be paid from the Treasury until the Treasury Department has received a certified copy of the law, but the Railroad Administration arranged to assist the railroad companies in meeting their July 1 requirements by paying out a considerable amount of cash on account of compensation from its working capital in view of the fact that its funds were soon to be available. The estimated requirements of the railroad companies for July 1 were $190,000,000. The War Finance Corporation has announced the following additional loans to railroads: Central Railroad of New Jersey, $768,800; Chicago, Burlington & Quincy, $2,216,000; Delaware & Hudson, $1,000,000; Northwestern Pacific, $540,000; Wheeling and Lake Erie, $24,480.

Railroad Administration Inquiring for Rail

The Railroad Administration is considering placing an additional order for rail. The 200,000 tons recently ordered will be delivered this month and it is expected the new order will be placed soon. Inquiries as to prices have been made of the steel companies.

Car Surplus Reduced

The net surplus of freight cars in the United States and Canada was reduced during May from 385,447 to 301,368, according to the monthly report compiled by the Car Service Section. Excluding the Canadian roads the net surplus was 284,828, as compared with 365,560 on May 1. The latest report represents the average for the month rather than the situation as of the first of the month. Of the total surplus, 145,737 were box cars, most of which are being held in the west in preparation for the grain traffic. There were also 99,974 surplus coal and gondola cars. The shortages are scattering and consist mostly of box cars. On June 1, 1918, there was a net surplus of 71,000 cars; on June 1, 1917, there was a shortage of 105,000 and on June 1, 1916, there was a surplus of about 50,000. The present net surplus represents a reduction of 36 per cent from that of March 1, the high point this year, when it was 473,000. The detail figures by regions are given in the table.

SUMMARY OF CAR SURPLUSES AND SHORTAGES REPORTED ON JUNE 1, 1919

(FIGURES INDICATE AVERAGE FOR MAY)

Region	Surpluses									Shortages								
	Box	Flat	Coal and gond.	Refr.	Stock	Coke	Furn.	Misc.	Total	Box	Flat	Coal and gond.	Refr.	Stock	Coke	Furn.	Misc.	Total
Eastern	*5,039	488	20,106	199	175	2,163	513	413	29,096	121	154	0	19	21	0	0	0	315
Allegheny	235	28	33,569	251	47	720	0	706	35,556	89	15	0	0	0	0	0	0	104
Pocahontas	62	3	469	0	127	0	0	0	661	0	0	0	0	0	0	0	0	0
Southern	24,620	524	10,769	1,760	2,946	303	11	127	41,060	125	299	31	0	0	0	0	0	455
Northwestern	20,942	1,916	7,687	2,967	7,713	0	43	1,103	42,371	896	0	0	0	0	0	0	0	896
Central Western	48,162	1,601	18,257	3,687	8,960	369	419	83	81,538	227	0	132	17	0	0	0	0	376
Southwestern	34,627	2,230	6,667	2,865	5,151	0	270	4,892	56,702	10	0	0	0	0	0	0	0	10
Total	133,687	6,790	97,524	11,729	25,119	3,555	1,256	7,324	286,984	1,468	468	163	36	21	0	0	0	2,156
Canadian roads	12,050	775	2,450	615	850	0	0	0	16,740	0	0	0	0	0	0	0	200	200
Grand total	145,737	7,565	99,974	12,344	25,969	3,555	1,256	7,324	303,724	1,468	468	163	36	21	0	0	200	2,356

*Principally automobile box.

Arrangements to Put Permit System Into Effect

The organization of the necessary machinery for the permit system on grain has been perfected and the system will be put into effect as soon as it appears to be necessary to prevent the clogging of the railroads which has frequently occurred in the past with resulting loss to farmers and grain dealers. In no other way, Mr. Hines says, can the railroads be used to their maximum capacity in times of heavy business. Without such control consignors will load more grain than can be taken by consignees and thus loaded cars will accumulate to such a point as seriously to obstruct transportation, create car shortages and produce widespread inconvenience. Public announcement will be made before the system actually is put into effect.

The following plan has been adopted: Grain control committees will be appointed in each of the following primary markets: Duluth, including Superior, Minneapolis, including St. Paul, Milwaukee, Chicago, Peoria, St. Louis, including East St. Louis, Kansas City, St. Joseph, Omaha, including Council Bluffs, Detroit, Toledo, Cleveland, Cincinnati, Indianapolis, Wichita, and Fort Worth. Each committee will consist of three members, two representing the Railroad Administration and one the transportation division of the United States Grain Corporation.

In lieu of the individual permit system that obtained last year, and which will only be continued this year on a portion of the traffic, a so-called "blanket permit system" will be put into operation this year, at least at the outset, and until it may develop that this plan does not accomplish the desired purpose.

The "blanket permit system" will obtain in connection with the transportation of grain from country stations to the primary markets herein specified, while the "individual permit system" will be continued only in connection with the movement of grain between the primary markets referred to; in other words, grain that originates at one of these primary markets and is consigned for delivery at another of the primary markets. It will also be continued on grain originating at these primary markets and at country stations, when

the grain shipped is consigned to Atlantic or Gulf sea ports.

The "individual permit system" contemplates that before a shipper of grain may load a car, he shall first have secured an individual transportation permit from the grain control committee at the market involved, which permit becomes the authority of the railroad agent at point of origin to allow the loading and forwarding of the shipment.

The "blanket permit system" contemplates that permits shall be issued by the grain control committees directly to the individual railroads and not to shippers. Each grain control committee will ascertain the number of carloads of grain its market can daily absorb, based on storage capacity, prospective out-shipments, track capacity, etc., and will then allocate this number among the different lines serving the market on a fair and equitable basis, due consideration also being given in the distribution, to connecting lines whose own rails do not reach the market directly. Under this plan, each railroad will only be permitted to *load* daily the number of carloads prescribed by the committee, and each railroad will be expected to distribute its loading as between its shippers in as fair a manner as possible.

This plan, according to the announcement by the Railroad Administration, will obviate the necessity for individual permits to shippers for the transportation of grain from country stations to these interior primary or terminal markets, and should tend to eliminate to a very large degree any grounds for complaints from shippers of delays that were received to some extent last season, when the individual permit plan was in effect. Under the blanket permit system, the producer will apply to the local agent on his railroad in the same manner as he would do were the permit system not in effect.

The circumstances surrounding transportation between primary markets and also to seaports, are so different from the circumstances attending the "gathering service" from country stations to primary markets that to extend the "blanket system" to include this transportation, it is stated, would not effect the proper results. This tonnage is usually offered in large lots by comparatively few shippers, and in the case of seaboard traffic, is subject to individual steamship contracts, which contracts are confirmed by proper railroad authorities before the permits are issued.

At a conference in New York on June 10, at which all grain interests were represented, the producer, the country elevator operator, the miller, the dealer, the terminal elevator operator and the exporter—it was unanimously agreed that some control of transportation of grain would be necessary this coming season if the maximum efficiency of transportation facilities were to be attained and the interests of the shipping public conserved, and the plan as above outlined, seemed to meet with the approval of at least the majority of the representation present.

Proposed Capital Expenditures for 1919

The following estimate of the capital expenditures proposed to be made on Class I railroads for 1919, amounting to $825,715,471, of which $245,585,643 is for standard equipment ordered by the Railroad Administration and $580,129,828 for additions and betterments, was filed with the House appropriation committee by Swagar Sherley, director of the Division of Finance. The estimate of the requirements of the Railroad Administration submitted by Mr. Hines provided for $253,000,000 of the amount, or only $8,000,000 more than the cost of the equipment, to be carried by the Railroad Administration and it was expected that whatever of the balance was actually carried out would be financed by the corporations.

ESTIMATE OF CAPITAL EXPENDITURES TO BE MADE DURING 1919, CLASS I RAILROADS

Roads	Contract rental (standard return if contract not signed)	Other corporate income	Total corporate income	Interest, rentals, taxes, corporate expenses, and sinking and reserve funds	Dividends declared (authorized) 1918	Surplus after fixed charges and dividends[1]	Estimate of capital expenditures for calendar year 1919: Road and equipment excluding United States Railroad Administration equipment	Estimate of capital expenditures for calendar year 1919: United States Railroad Administration equipment	Estimate of capital expenditures for calendar year 1919: Total
Alabama & Vicksburg	$322,854	$73,150	$396,004	$170,364	$147,000	$78,640	$299,320	.....	$299,320
Alabama Great Southern	1,703,180	163,928	1,867,108	668,605	784,725	413,778	1,503,188	.....	1,503,188
Ann Arbor	526,883	6,900	533,783	413,082	.....	120,701	80,594	$915,000	995,594
Atchison, Topeka & Santa Fe (including W. C. & S. F. and P. H. & S. F.)	42,885,311	6,961,000	49,846,311	15,662,000	19,498,280	14,686,031	26,596,664	7,659,300	34,255,964
Atlanta & West Point	752,995	66,214	319,209	41,803	147,816	129,590	407,375	44,087	451,462
Atlanta, Birmingham & Atl'c	358,058	43,000	401,058	401,058	.....	.....	1,272,739	1,014,550	2,287,289
Atlantic & St. Lawrence	[2]	.....	.....	575,109	.....	d 575,109	278,276	804,000	1,082,276
Atlantic City	222,066	9,000	231,066	301,972	.....	d 70,906	289,093	.....	289,093
Atlantic Coast Line	10,185,942	4,176,999	14,362,941	7,076,131	4,808,993	2,477,817	2,903,656	343,454	3,247,110
B. & O. Sys. (includ. St. Is.)	30,031,009	3,037,437	33,068,446	23,602,285	8,422,247	1,043,914	12,909,721	20,155,387	33,065,108
Bangor & Aroostook	1,575,172	20,000	1,595,172	1,110,165	359,400	125,607	258,903	.....	258,903
Bessemer & Lake Erie	4,674,714	30,250	4,704,964	2,390,423	750,000	1,564,541	1,843,259	337,880	2,181,139
Boston & Maine	9,478,075	700,000	10,178,075	9,533,380	.....	644,695	6,438,470	10,322,000	16,760,470
Buffalo & Susquehanna	592,628	198,935	791,563	340,224	370,000	81,339	51,063	.....	51,063
Buffalo, Rochester & Pitts.	3,276,410	300,000	3,576,410	2,614,220	780,000	182,190	1,060,984	264	1,061,248
Carolina, Clinchfield & Ohio	1,631,172	10,000	1,641,172	1,495,350	.....	145,822	1,806,493	1,056,081	2,862,574
Central of Georgia	3,444,159	720,238	4,164,397	2,680,321	1,150,000	334,076	2,677,665	.....	2,677,665
Central New England	1,468,124	62,000	1,530,124	905,100	.....	625,024	688,504	.....	688,504
Central R. R. of New Jersey	9,352,301	2,000,000	11,352,301	6,776,550	3,292,416	1,283,335	5,187,641	5,404,709	10,592,350
Central Vermont	779,098	13,039	792,137	859,008	.....	d 66,871	201,991	.....	201,991
Charleston & West. Carolina	466,921	103,841	570,762	342,953	72,000	155,809	143,668	875,700	1,019,368
Chesapeake & Ohio (including C. & O. of Ind.)	13,226,983	882,000	14,108,983	9,897,492	2,511,264	1,700,227	10,708,953	9,578,261	20,287,214
Chicago & Alton	3,178,315	129,343	3,307,658	3,943,376	.....	d 635,718	2,978,216	1,348,937	4,327,153
Chicago & Eastern Illinois	2,946,001	200,000	3,146,001	4,610,775	.....	d 1,464,774	1,890,586	3,146,156	5,036,742
Chicago & North Western	23,364,029	2,263,000	25,627,029	11,950,725	11,952,275	1,724,029	10,268,222	2,744,945	13,013,167
Chicago, Burlington & Quin. (including Q. O. & K. C.)	33,390,080	577,200	33,967,280	10,821,350	8,867,128	14,278,802	11,347,040	4,615,668	15,962,708
Chicago Great Western	2,953,450	100,000	3,053,450	1,746,920	878,532	427,998	895,185	232,437	1,127,622
Chicago, Indianapolis & Lou.	1,620,259	116,400	1,736,659	1,214,967	199,652	322,040	656,453	1,143,700	1,800,153
Chicago, Milwaukee & St. P.	27,946,771	2,000,000	29,946,771	24,128,000	.....	5,818,771	33,363,069	23,506	33,386,575
Chicago, Peoria & St. Louis	127,540	4,000	131,540	213,425	.....	d 81,885	21,379	.....	21,379
Chicago, Rock Island & Pac. (including C. R. I. & G.)	15,883,891	575,000	16,458,891	11,487,200	3,566,027	1,405,664	16,457,864	7,048,000	23,505,864
Chic., St. P., Minn. & Oma.	4,934,790	65,000	4,999,790	2,693,475	1,715,986	590,329	1,118,233	1,998,900	3,117,133
Chic., Terre Ha. & Southeast.	922,785	6,000	928,785	799,733	.....	129,052	161,781	.....	161,781
Cin., Indianapolis & Western	422,213	1,500	423,713	351,363	.....	72,350	186,408	.....	186,408
Cin., N. Orleans & Tex. Pac.	3,541,040	64,000	3,605,040	1,767,847	511,370	1,325,823	5,213,536	.....	5,213,536
Cincinnati Northern	317,628	9,200	326,828	111,505	90,000	125,323	251,008	.....	251,008
Cleve., Cin., Chic. & St. Lou.	9,945,738	836,000	10,781,738	6,700,600	499,925	3,581,213	7,762,188	3,360,424	11,122,612
Colorado & Southern (includ. Wichita Valley)	2,833,579	1,547,850	4,381,429	2,731,950	680,000	969,479	1,423,512	1,182,600	2,606,112
Delaware & Hudson	7,409,600	3,197,121	10,606,721	6,084,000	3,825,370	697,451	1,823,667	4,342,000	6,165,667
Delaware, Lackaw'a & West.	15,749,477	5,932,314	27,681,791	7,408,959	844,080	5,828,752	2,133,549	4,907,400	7,040,949

ESTIMATE OF CAPITAL EXPENDITURES TO BE MADE DURING 1919, CLASS I RAILROADS

Roads	Contract rental (standard return if contract not signed)	Other corporate income	Total corporate income	Interest, rentals, taxes, corporate expenses, and sinking and reserve funds	Dividends declared (authorized) 1918	Surplus after fixed charges and dividends[1]	Estimate of capital expenditures for calendar year 1919: Road and equipment excluding United States Railroad Administration equipment	United States Railroad Administration equipment	Total
Denver & Rio Grande	8,319,377	1,000,000	9,319,377	9,124,000	.....	195,377	2,431,842	.....	2,431,842
Denver & Salt Lake	[2]353,290	11,207	364,497	430,869	.....	d 66,372	8,480	.....	8,480
Detroit & Mackinac	310,664	1,000	311,664	130,534	97,500	83,630	840	.....	840
Detroit & Toledo Shore Line	[2]456,512	16,543	473,055	173,393	114,240	185,422	108,437	.....	108,437
Detroit, Toledo & Ironton	225,895	15,000	240,895	564,904	.....	d 324,009	1,173,480	809,100	1,982,580
Duluth & Iron Range	2,355,242	300,000	2,655,242	1,084,550	1,300,000	270,692	450,006	.....	450,006
Duluth, Missabe & Northern	5,122,051	135,000	5,257,051	1,975,500	411,250	2,870,301	1,098,883	623,000	1,721,883
Duluth, South Shore & Atlan.	594,637	30,000	624,637	455,577	.....	169,060	160,042	583,800	743,842
Elgin, Joliet & Eastern	2,862,177	35,000	2,897,177	2,461,000	400,000	36,177	677,339	1,929,100	2,606,439
El Paso & Southwestern	4,145,102	321,450	4,466,552	1,218,200	2,000,000	1,248,352	812,751	731,001	1,543,752
Erie (includ. Chicago & Erie)	15,729,068	4,225,700	19,954,768	15,104,900	.....	4,849,868	7,023,160	12,008,450	19,031,610
Florida East Coast	2,842,842	15,000	2,857,842	2,036,066	.....	821,776	449,495	1,525,000	1,974,599
Fort Worth & Denver City	1,891,386	134,600	2,025,986	816,900	639,152	569,934	1,380,585	.....	1,380,585
Ga. R. R., lessee organization	[2]858,622	21,921	880,543	740,580	.....	139,963	1,132,849	1,009,800	2,142,649
Georgia Southern & Florida	511,457	9,900	521,357	360,099	88,400	72,858	121,052	.....	121,052
Grand Rapids & Indiana	929,385	27,500	956,885	502,900	.....	453,985	1,250,991	.....	1,250,991
Grank Trunk Western (including C. D & C., G. G. T. J. & D. G. H. & M.)	[2]1,012,994	386,657	1,399,651	2,399,282	.....	d 999,631	1,932,629	716,656	2,649,285
Great Northern	28,771,361	5,373,634	34,144,995	14,218,350	17,462,865	2,463,780	9,089,494	4,378,500	13,467,994
Gulf & Ship Island	[2]597,456	12,924	610,380	644,834	.....	d 34,454	158,805	175	158,805
Gulf Coast Lines	1,101,216	100,000	1,201,216	1,120,851	.....	80,365	124,900	.....	124,900
Gulf, Mobile & Northern	586,810	5,000	591,810	131,950	.....	459,860	1,441,281	.....	1,441,281
Hocking Valley	2,637,167	91,560	2,728,727	1,688,950	439,980	599,797	3,395,611	1,348,500	4,744,111
Ill. Cent. (includ. Y. & M. V.)	20,144,691	7,758,200	27,902,891	16,847,100	7,650,720	3,405,071	13,965,566	5,514,000	19,479,566
International Great Northern	1,394,946	2,150	1,397,096	1,158,450	.....	238,646	1,440,107	.....	1,440,107
Kan. City, Mex. & O. (includ. K. C. M. & O. of Tex.)	150,000	5,360	155,360	494,662	.....	d 339,302	15,245	.....	15,245
Kan. City Southern (includ. Texarkana & Fort Scott)	3,216,698	50,993	3,267,691	2,230,092	840,000	197,599	1,783,821	152,700	1,936,521
Lake Erie & Western	1,548,542	65,000	1,613,542	955,050	.....	658,492	1,613,074	132,656	1,745,730
Lehigh & Hudson River	519,371	10,161	529,532	227,612	206,340	95,580	59,254	175	59,249
Lehigh & New England	1,135,761	10,000	1,145,761	491,031	504,000	150,730	200,409	.....	200,409
Lehigh Valley	11,321,233	2,032,000	13,353,233	8,273,592	6,060,800	d 981,159	5,884,928	6,597,500	12,482,428
Long Island	3,221,949	611,548	3,833,497	3,200,654	.....	632,843	881,376	1,560,500	2,441,876
Los Angeles & Salt Lake	3,420,417	63,713	3,484,130	2,951,186	.....	532,944	1,620,060	.....	1,620,060
Louisiana & Arkansas	407,987	6,000	413,987	388,394	.....	25,593	39,787	.....	39,787
Louisville & Nashvile	17,310,495	2,512,800	19,823,295	10,729,660	5,040,000	4,053,635	11,211,510	5,403	11,216,913
Louis., Henderson & St. L.	343,916	12,800	356,716	241,500	.....	115,216	182,568	.....	182,568
Maine Central	2,955,697	340,000	3,295,697	2,337,900	870,888	86,909	2,246,134	1,525,000	3,771,134
Michigan Central	8,105,727	1,100,000	9,205,727	6,967,022	749,456	1,489,249	7,621,953	5,111,692	12,733,645
Midland Valley	444,346	60,000	504,346	669,200	.....	d 164,854	298,380	.....	298,380
Mineral Range	147,432	1,000	148,432	136,880	.....	11,552	30,587	.....	30,587
Minneapolis & St. Louis	2,639,857	200,000	2,839,857	2,464,042	.....	375,815	2,231,392	875,000	3,106,392
Minneap., St. P. & S. Ste. M.	10,547,429	825,000	11,372,429	7,931,140	3,097,338	343,951	1,588,287	.....	1,588,287
Minnesota & International	202,455	28,640	231,095	120,850	25,000	85,245	23,065	.....	23,065
Missouri North Arkansas	175,000	4,500	179,500	146,340	.....	33,160	74,023	.....	74,023
Missouri, Kansas & Texas	5,853,831	620,000	6,473,831	5,276,500	.....	1,197,331	6,614,426	.....	6,614,426
Mo., Kan. & Tex. R.R. of Tex.	621,773	21,000	642,773	2,682,940	.....	[1]2,040,167	603,065	.....	603,065
Missouri Pacific	14,206,814	640,000	14,846,814	11,760,326	.....	3,086,488	6,679,518	7,075,500	13,755,018
Mobile & Ohio	2,597,478	50,000	2,647,478	1,664,000	240,672	742,806	504,589	360,000	864,589
Monongahela	583,086	400	583,486	416,000	.....	167,486	353,900	.....	353,900
Nashv., Chattanooga & St. L.	3,182,089	151,300	3,333,389	1,615,613	1,126,000	597,776	2,145,448	539,837	2,685,285
New Orleans & Northeastern	1,204,992	38,000	1,242,992	523,964	360,000	359,028	1,986,417	.....	1,986,417
N. Y. C. (includ. Bos. & Al.)	58,122,085	14,509,180	72,631,265	47,760,391	12,929,610	11,941,264	38,280,410	12,878,522	51,158,932
N. Y., Chicago & St. Louis	2,218,857	450,000	2,668,857	2,217,594	.....	451,263	1,736,133	1,459,937	3,196,070
N. Y., New Haven & Hart.	17,095,884	5,679,000	22,774,884	22,012,000	.....	762,884	16,563,063	2,612,581	19,175,644
New York, Ontario & West.	2,103,589	310,945	2,414,534	1,538,639	581,281	294,614	250,327	.....	250,327
New Orleans Great Northern	575,952	11,000	586,952	455,700	.....	131,252	47,619	.....	47,619
N. Y., Susquehanna & West.	980,135	50,000	1,030,135	868,887	.....	161,248	325,443	.....	325,443
Norfolk & Western	20,740,879	1,177,000	21,917,879	6,947,000	9,357,103	5,613,776	18,145,350	2,440,000	20,585,350
Norfolk Southern	1,166,991	48,000	1,214,991	1,270,434	.....	d 55,443	531,770	610,000	1,141,770
Northern Pacific	30,130,069	8,627,000	38,757,069	17,200,300	17,360,000	4,196,769	7,986,943	.....	7,986,943
Northwestern Pacific	1,235,101	7,200	1,242,301	1,431,164	.....	d 188,863	449,145	291,900	741,045
Pennsyl. Railroad Lines west	14,992,785	1,200,000	16,192,785	14,134,400	.....	2,058,385	22,803,262	1,358,570	24,161,832
Pitts., Cin., Chic. & St. L.	11,334,094	196,500	11,530,594	8,297,700	3,380,646	d 147,372	22,344,836	990,000	23,334,836
Pennsyl. Railroad Lines east	53,224,973	24,006,044	77,231,017	37,188,170	30,677,380	9,365,467	34,762,170	13,321,000	48,083,170
Pere Marquette Railroad	3,748,196	105,000	3,853,196	2,024,510	560,000	1,268,686	4,955,221	.....	4,955,221
Philadelphia & Reading	15,868,331	595,000	16,463,331	6,796,500	6,372,255	3,294,576	10,313,174	11,888,000	22,201,174
Pittsburgh & Lake Erie	8,980,219	710,000	9,690,219	3,412,500	3,598,560	2,679,159	4,010,670	3,702,701	7,713,371
Pittsburg & Shawmut	606,048	167,636	773,684	1,007,755	.....	234,071	30,277	.....	30,277
Pittsburgh & West Virginia	237,010	1,102,000	1,339,010	52,635	546,000	740,375	261,919	72,131	334,050
Port Reading	235,698	35,000	270,698	84,000	120,000	66,698	435,250	.....	435,250
Richm'd, Fred'ksb'g & Poto.	1,137,374	136,070	1,273,444	495,935	452,731	324,778	789,915	1,525,000	2,314,915
Rutland Railroad	1,023,883	82,500	1,106,383	553,202	179,108	374,073	590,657	44,350	635,007
St. Joseph & Grand Island	273,811	11,732	385,543	244,768	.....	140,775	515,980	.....	515,980
St. Louis-San Francisco	13,364,479	258,000	13,622,479	14,118,400	.....	d 495,921	4,254,413	7,075,500	11,329,913
St. Louis Southwestern	4,013,337	175,000	4,188,337	3,207,292	.....	981,045	3,773,323	.....	3,773,323
San Antonio & Aransas Pass	373,052	.....	373,052	1,193,674	.....	d 820,622	146,427	.....	146,427
Seaboard Air Line	6,497,025	150,530	6,647,555	6,888,800	.....	d 241,245	2,742,775	2,819,937	5,562,712
Southern Pacific	48,167,343	12,697,954	60,865,297	30,814,510	16,404,509	13,646,278	20,601,193	6,100,000	26,701,193
Southern Railw'y in Miss'ppi	6,900	3,750	10,740	12,785	.....	d 2,045	5,906	.....	5,906
Southern Railway	18,653,993	2,007,798	20,661,691	15,251,508	3,000,000	2,410,183	24,327,723	9,538,924	33,866,647
Spokane, Portland & Seattle	2,096,952	189,700	2,286,652	4,127,734	.....	d 1,841,082	538,709	875,700	1,414,409
Tennessee Central	162,734	d 2,500	160,234	696,341	.....	d 536,197	348,156	.....	348,156
Texas & Pacific	4,167,432	285,000	4,392,432	2,351,680	.....	20,040,752	6,565,838	1,374,381	7,940,219
Toledo, Peoria & Western	159,740	11,285	171,025	252,810	.....	d 81,785	5,417	.....	5,417
Toledo, St. Louis & Western	[2]994,294	83,819	1,078,113	1,145,595	.....	d 67,482	325,685	3,572,250	3,897,935
Ulster & Delaware	128,009	70,000	198,009	149,425	57,000	d 8,416	9,017	.....	9,017
Union Pacific	38,552,929	12,053,421	50,606,350	18,234,928	26,210,900	6,160,522	34,883,360	1,612,875	36,496,235
Vicks., Shreveport & Pacific	337,948	73,000	410,948	210,478	107,140	93,330	200,713	.....	200,713
Virginian Ry.	3,247,603	220,000	3,467,603	2,069,500	.....	1,398,103	3,881,789	1,884,000	5,725,789
Wabash Ry.	5,826,810	725,155	6,551,965	4,822,297	462,000	1,267,668	2,307,094	7,076,375	9,383,469
Washington Southern	468,433	25,472	493,905	234,120	80,000	179,785	62,574	.....	62,574
Western Maryland	3,079,593	175,000	3,254,593	2,938,245	.....	316,348	2,778,558	915,000	3,693,558
Western Pacific	1,900,350	507,132	2,407,482	1,278,953	.....	1,128,529	2,751,927	53,775	2,805,702
Western Ry. of Alabama	288,238	45,877	334,115	125,056	180,000	29,059	427,397	.....	427,397
West Jersey & Seashore	952,682	170,336	1,123,018	565,648	585,553	d 28,183	778,450	.....	778,450
Wheeling & Lake Erie	1,586,037	155,200	1,741,237	1,412,700	.....	328,537	391,350	3,605,839	3,997,189
Wichita Falls & Northwest'n	145,245	42,402	187,647	363,991	.....	d 176,344	10,439	.....	10,439
Equip't ordered, not assigned	.....	.....	.....	.....	.....	.....	.....	31,641,179	31,641,179
Credit for scrap	.....	.....	.....	.....	.....	.....	.....	d 35,433,000	d 35,433,000
Total	$895,003,076	$156,032,158	$1,051,035,234	$625,370,308	$267,244,763	[2]$169,102,479	$580,129,828	$245,585,643	$825,715,471

[1]The total of this column represents the amount actually applicable to additions and betterments. [2]Estimate based on 1917 figures. d—Decrease.

Passenger Traffic in March

The number of passengers carried one mile in March was 3,446,000,000, an increase of 2 per cent as compared with March, 1918, according to the monthly report compiled by the the Operating Statistics Section. For the three months ended March 31 the increase was 7 per cent. In March there were decreases in the Ohio-Indiana district and the Southern and Southwestern regions. The figures follow:

Railroad	Average miles operated	Month of March 1919	Month of March 1918	Per cent increase or decrease	Three months ended March 31 1919	Three months ended March 31 1918	Per cent increase or decrease
Total, New England District	8,116	283,818,779	272,674,457	4.1	823,508,554	761,709,654	8.1
Total, Central District	22,336	464,304,768	444,895,140	4.4	1,395,991,786	1,244,777,969	12.1
Total, Ohio-Indiana District	6,890	68,020,636	76,049,697	d 10.6	203,000,674	199,184,404	1.9
Total, Eastern Region	37,342	816,144,183	793,619,294	2.8	2,422,501,014	2,205,672,027	9.8
Total, Allegheny Region	19,771	713,268,050	687,971,944	3.7	2,050,402,140	1,839,827,887	11.4
Total, Pocahontas Region	5,094	79,335,316	65,174,998	21.7	230,006,898	182,802,332	25.8
Total, Southern Region	37,780	517,320,391	519,735,183	d 0.5	1,504,839,027	1,459,435,572	3.1
Total, Northwestern Region	46,345	394,388,584	382,967,773	3.0	1,131,474,400	1,052,089,336	7.5
Total, Central Western Region	51,589	630,396,027	635,276,732	d 0.8	1,836,529,416	1,787,483,500	2.7
Total, Southwestern Region	31,635	296,019,446	293,484,721	0.9	874,268,765	865,254,309	1.0
Grand total, all regions	229,556	3,446,871,997	3,378,230,645	2.0	10,049,521,660	9,392,564,963	7.0

d—Decrease.

Through Export Bills of Lading

An understanding has been reached between the Railroad Administration and practically all the steamship companies operating on the Pacific coast under which those companies will assume any demurrage or storage charges for which they may be responsible in connection with through export bills of lading issued by the railroads under federal control through those ports, that understanding to be effective as soon as tariffs can be published. A similar understanding has been reached with Osaka Shosen Kaisha, which has recently inaugurated service between the port of New Orleans and the Far East. Negotiations to bring about a similar understanding with steamship companies operating from Gulf and South Atlantic ports are being conducted.

In January, 1918, on account of the crucial situation existing as to ocean tonnage, due to the war, through export bills of lading via North Atlantic ports were discontinued, but with the signing of the armistice and the consequent gradual release of shipping, with increased opportunity for export trade, the exporters of the United States have been anxious that through bills of lading through these ports should be reinstated. The through export bill of lading is of no direct value to the railroads; on the contrary, it is a source of expense and increased responsibility, but recognizing the great importance of this document to exporters, the Railroad Administration has been endeavoring for several months to arrange with the North Atlantic steamship lines for reestablishment of the export bill of lading under conditions that will be satisfactory to all interests.

Prior to January, 1917, at the time export bills of lading were being issued, the free time allowed at those ports was 10 days, the tariff providing that unless the cargo was lifted within that period, any demurrage or storage charges which might accrue would be guaranteed by the shipper. These regulations were approved by the Interstate Commerce Commission.

Efforts have been made by the Railroad Administration to bring about the same understanding as to North Atlantic ports as has been reached with regard to Pacific ports, namely, that the steamship companies assume any storage or demurrage charges that might accrue due to their failure to lift the cargo on the contract date, or within the contract period or free time period. To facilitate this understanding, the Railroad Administration offered to extend temporarily or until shipping had resumed normal conditions, the free time period to 15 days. Up to the present time it has been impossible to persuade the steamship companies serving North Atlantic ports to assume this storage or demurrage, as has been done with regard to Pacific ports. In order to go as far as possible in meeting the desires of the exporters, and pending further discussions with the steamship companies, the Railroad Administration has made arrangements to issue instructions to restore through export bills of lading via North Atlantic ports on the basis that prevailed prior to January, 1918, namely, that through bills of lading will be issued to shippers who will agree to assume any demurrage or storage charges which may accrue in accordance with published tariffs.

At the present time all export traffic through North Atlantic ports is handled on permits covering inland transportation, for which permit applications are made by the steamship companies in most instances, such applications indicating the contracted sailing date.

If the cargoes are not lifted by the steamship companies in accordance with their contracts or promises, there will be an effort to handle permits so that congestion of traffic will not result and so that the expense incident to storage or demurrage charges which may accrue due to failures on the part of steamship companies, will be reduced to a minimum.

Organized Draftsmen Ask Increased Pay

At a hearing before the Board of Railroad Wages and Working Conditions of the Railroad Administration recently at Washington, D. C., representatives of the International Federation of Draftsmen's Unions affiliated with the American Federation of Labor and claiming to represent about 2300 engineers and draftsmen employed on railroads, presented a minimum scale of pay which they asked the board to recommend to Director General Hines. The proposed scale is as follows:

	Minimum Salary per Month
Chief Draftsman	$300
Leading Draftsman or Squad Man	250
Draftsman, Class A	210
Draftsman, Class B	175
Draftsman, Class C	135
Tracer, Class A	125
Tracer, Class B	75
Assistant Engineer or Engineer Inspector	250
Assistant Inspector, Class A	200
Assistant Inspector, Class B	150
Instrument Man	210
Rodman, Class A	175
Rodman, Class B	150
Tape Man, Class A	125
Tape Man, Class B	*160

*Salary to increase $5 every six months as long as he continues to improve.

They also asked for the establishment of a 7½ hour day for five days a week and four hours on Saturday, making 41½ hours per week with no overtime except where absolutely necessary, or at the option of the employee, and time and one half for overtime ordered or made necessary; all traveling and other expenses incurred for railroad business and also expenses attached to moving headquaters; civil service rules to apply regarding vacation, holiday and sick leave; no salary now in existence to be reduced. The federation also presented a proposed classification defining the

qualifications for the various positions named in the wage scale.

It was also requested that the director general issue a general order that if any reduction in operating expenses in the engineering department must be made pro rata furloughs without pay be granted in place of discharging forces or reducing the rates of pay and that workers discharged or demoted be reinstated whenever they so desire. A request was also made that machinery be perfected and set in motion for the formation of permanent regulatory committees on each railroad composed of the various heads and sub-heads of the engineering departments to prepare budgets of the work and of the forces in each department necessary for carrying on the work during the fiscal year. It was suggested that representatives of these committees confer with similar representatives of other railroads or with a national committee to be formed to adjust the engineering forces to the work to be done on each railroad so that transfers could be made from roads which had a surplus of men to those which were in need of men.

New Locomotives May Be Shipped Dead

The Railroad Administration has revised the instructions issued early last year that new locomotives being delivered by the builders be sent under steam and hauling tonnage and the regional directors have been given discretion to decide whether new locomotives shall be sent dead in trains or under steam with a load, upon notifying the mechanical department. The question will depend on whether it will be practically useful to use the new locomotives for hauling tonnage that is going in the direction of the locomotives. The use of such locomotives when moving under steam will be accepted as full payment for transportation charges.

Number of Women Employees Reduced

The total number of women employed under the United States Railroad Administration reached the highwater mark on October 1, 1918. At that time there were on the rolls 101,785 female employees. The number of women employed on April 1, 1919, shows a decrease of 14.3 per cent as compared with January 1, 1919.

Statistics compiled by the Women's Service Section, giving the number of women employed and the character of their employment since the roads came under federal control have been made public by the director general.

On January 1 of the present year there were on the rolls of the railroads 99,694 women employees, while on April 1 the number had dropped to 85,393. This was due chiefly to the reduction of labor force which occurred in February and March. It was also partly due to the return of men from military service who were reinstated by the railroads. On the Eastern lines the drop was 17.7 per cent, while in the South it was 6.5 per cent, and in the West 11.4 per cent.

The clerical or semi-clerical occupations, including all the officeworkers, ticket sellers and telephone switchboard operators constituted the largest percentage of the total for the year 1918, being 72 per cent. The statistics show that more than 5,000 women were employed in railroad shops and more than 1,000 in round-house work. The latter included, among others, turntable operators and engine wipers. On October 1, 1918, there were 6 women employed as blacksmiths, helpers and apprentices, while a large number of others worked as boilermakers, coppersmiths, electricians and machinists. There were 377 women employed as station agents, assistants and agent operators on the same date, while 50 were at work as switch tenders. There were 931 pushing trucks and handling freight. Watchwomen to the number of 518 were employed on the railroads, doing duty both day and night.

The report shows that, considered from the point of view of occupation, the greatest reduction of women employees has taken place in round-houses and shops. Their work in these places was in many cases found unsatisfactory, there being too much heavy physical labor involved.

In the clerical occupations best fitted for women, the total number employed at the present time is 68,129. There has been a reduction in this group of 11.2 per cent.

W. T. Tyler, director of the Division of Operation, has addressed the following to the regional directors:

"In a recent case suits were filed against a chief despatcher and two trick despatchers of a certain railroad under federal control for violation of the hours of service law.

"The administration has done everything possible to get the Interstate Commerce Commission to agree to let it investigate complaints of the kind in question, handle them to a conclusion (including disciplinary action), and report the facts and the action taken to prevent similar occurrences to the commission, but without success. The following is the position taken by the commission, as set forth in letter signed by Hon. Clyde B. Aitchison, chairman, under date of June 13:

" 'In this connection, however, the commission desires it understood that these suits were instituted solely for the purpose of securing proper observance of the hours of service law and incidentally Order Number 8 of the director general, not only by railroad companies, but also by officers and agents in charge of employees thereof. We are of the opinion that the best way to bring about this result is to allow the law to take its course.

" 'In regard to request to permit the Railroad Administration to investigate and to take care of any future violations of the 16-hours of service law that might occur the commission is of the opinion that it cannot delegate this power but must carry out to the letter, the requirements of the law. The commission has no right to waive or evade the administering of this law. Therefore, if cases arise under it in the future, it will handle them in accordance with the facts and circumstances surrounding each case.'

"Please give this information the widest possible circulation among the employees of railroads under federal control in order that they may be forewarned as to the intention of the commission to prosecute the individual officers and employees responsible for violations of the hours of service law."

May Returns Show Addition to Deficit

The railroads in May earned only about half of the standard return guaranteed by the government, according to preliminary returns which have been received by the Interstate Commerce Commission. For 195 roads the net operating income was $38,530,000, a decrease of 46.4 per cent as compared with May, 1918. For the test period the average net operating income for May was $77,000,000, which also represents approximately one-twelfth of the standard return. The operating revenues were $407,943,000, an increase of 9.3 per cent as compared with May, 1918; operating expenses were $350,861,000, an increase of 24.1 per cent, and taxes were $15,612,000, an increase of 1 per cent.

Uniform Rules and Working Conditions

It is understood that the work on the proposed uniform rules and working conditions for maintenance of way employees is well advanced and that they will soon be announced by the director general for application on all roads under federal control, superseding all previous agreements on this subject. Proposed rules and working conditions were recommended to the Board of Wages and Working Conditions by

committees consisting of one representative of each regional director and an equal number of representatives of the employees and the director general's announcement will be based on the recommendations of the board.

Maintenance Instruction for Last Six Months of 1919

New instructions outlining a working basis for maintenance of way expenditures for the last six months of 1919 have been issued to the regional directors by W. T. Tyler, director of the Division of Operation. They supersede to some extent previous instructions, and particularly the order to limit maintenance of way expenditures for June to the average test period ratio of such expenses to operating revenues, which was merely a temporary order intended to hold the situation check until more explicit directions could be issued.

While the new instructions are tentative and temporary, in order to control maintenance of way expenditures month by month during the remainder of 1919 to the end that the contract obligations of the Railroad Administration to the railroad companies may be fully complied with but not exceeded, they provide a definite basis on which maintenance officers may proceed as well as prescribing the character of the information which is to be used as the final standard. In the normal case the program to be followed will be determined tentatively, as it has been in the past, by considering the amount of work necessary to make the average for 1918 and 1919 match up with the average for the test period, but in order to determine whether this is a fair basis the 10 years before federal control are to be considered. Mr. Tyler's letter to the regional directors emphasizes that, whereas there has been a general tendency to accept the test period standard as the yardstick by which to determine the contract obligations, this may not be the proper absolute standard in many instances, and the entire obligation of the government is to make such expenditures upon the properties, equated as to the prices and wages obtaining during the period of federal control, as will result in returning them to the companies at the end of federal control in substantially as good condition and in substantially as complete equipment as when they were taken over. The government has the option to treat the quantities of labor and material used during the test period, modified by the volume of business done, as the maximum of its obligations.

The officers of the Railroad Administration have devoted a great deal of time to the preparation of these instructions, which are based on recommendations made at a conference of the engineering assistants to the regional directors with A. M. Burt and W. J. Cunningham, assistant directors of the Division of Operation, on June 20 and 21.

Instructions are to be issued to the federal managers and through them to the local supervising officers providing for an analysis of the expenditures during the test period to determine tentatively whether they fairly represent the contract obligations and can be taken as a basis for the expenditures during federal control. In making such analysis the expenditures and quantities of the most important materials during the test period, during the seven years prior to the test period, and during the six months between the end of the test period on June 30, 1917, and the beginning of federal control, are to be taken into consideration. It is stated that the maintenance of way expenditures can best be controlled by regulating the number of man hours and also the amounts of the principal classes of materials, such as rails, ties and ballast. The performance of 1918 and 1919 combined should not exceed the contract obligations as tentatively determined by the use of equation factors representing the differences in wages and prices between the test period and the period of federal control. The engineering assistants of the regional directors have already made substantial progress in working out such equation factors for the different roads in their territory. After considering the contract obligations in connection with the expenditures and quantities prior to federal control, each federal manager is directed to furnish a recommendation to his regional director, showing the tentative allowances for 1918 and 1919 as equated, the expenditures made during the period of federal control up to June 30 and the balance remaining for the last half of this year, and to regulate the labor and materials to insure that the expenditures for the remaining period will not exceed the available balance. In special cases where conditions require the performance of a greater amount of work recommendations of the federal managers, if approved by the regional director, are to be submitted to the director of operation.

If the program for 1919 does not, according to this tentative basis, exceed the contract obligations, the regional directors may authorize the federal managers to proceed with the minimum expenditures necessary to insure the return of the property in substantially as good condition and equipment as on January 1, 1918. Distribution of the work by months is to be made by the regional directors, taking into consideration the conditions that may make necessary heavier expenditures for any month than the average.

As soon as figures are available, the regional directors are to submit statements to the director of operation for the roads on which the test period expenditures are considered to have been normal, showing the expenditures and equation factors, together with the program recommended for the last six months of 1919, and whether or not this represents an excess or shortage as compared with the tentative balance arrived at by subtracting the actual expenditures for 18 months from the equated expenditures for the two-year period. In cases where the test period expenditures are considered subnormal, or abnormal, or where the expenditures during the last six months of 1917 were considered subnormal, special statements are to be submitted reporting the facts with recommendations to cover the qualifying factors. These special statements will cover cases where it will be necessary to make expenditures in excess of the obligation in the interest of safety and also special cases where there have been substantial increases in track mileage or abnormal maintenance or traffic conditions.

Supplementary instructions are to be issued covering the subject of tie renewals.

While the Railroad Administration takes the position that an excess of expenditures for maintenance of equipment on any road may fairly be considered together with, and as an offset against, any deficiency that may result in maintenance of way expenditures on that road, it is stated that it is not the purpose deliberately to curtail maintenance of way in any respect with this in view and the new instructions treat maintenance of way expenditures on their own feeting, giving directions for making them comply with the contract requirements independently of the equipment situation. Director General Hines has stated that, taking roadway and structures and equipment together, the average condition of the property as a whole is as well off as it was on January 1, 1918. This is because on some roads the equipment had got into a very run down condition at the end of 1917, as the result of the great pressure that had been put upon railroad facilities, and it was therefore necessary to make very heavy expenditures in 1918 in order to put it in condition for handling the war traffic, at a time when no one then knew how long it would last. Since the armistice traffic has fallen off and there was a mild winter, with the result that a large amount of equipment put in readiness for the winter is now being stored. A reserve of over 4,000 locomotives has been put in storage and every effort has been made to put the cars in good condition to handle the grain crops. Instructions were recently issued that car repair forces be put on full time at all points where a reduction in hours has

been made and special attention is to be given to grain, coal and refrigerator cars in the sections where such cars are most needed.

In connection with figures showing the number of unserviceable locomotives and cars, Railroad Administration officials point to the fact that many locomotives are now reported as unserviceable, which merely require a few hours' work and could be used if necessary and would formerly not have been classified as unserviceable; also that cars which are in storage or are transferred from one region to another to be put in storage for the grain traffic may automatically be transferred to the bad order class because while good for most commodities they require some recoopering to fit them for grain.

The maintenance of way and maintenace of equipment programs are not being treated alike because they represent somewhat different situations. The equipment is being prepared for a possible car shortage this fall, but instructions have also been used to the regional directors to concentrate repairs on locomotives and cars which by reason of their size can render the most efficient and economical service, to discontinue expenditures on small locomotives and cars not necessary for current use, and for the prospective traffic for the balance of the year, and to confine expenditures on small capacity freight cars to those authorized by Circular No. 20.

Contracts Executed

The Railroad Administration has executed a contract with the Baltimore & Ohio, providing for an annual payment of $30,031,009, which includes $2,136,932 in addition to the standard return.

The Railroad Administration has executed compensation contracts with the Hudson & Manhattan, providing for an annual payment of $3,003,362, and the Minneapolis Eastern for $30,332.

Committee on Automatic Train Control

The Committee on Automatic Train Control will go on another inspection trip next week to examine automatic train control devices on the Pennsylvania, at the plant of the Union Switch & Signal Company at Swissville, Pa., and at Indianapolis.

An Unusual Service of Creosoted Piles

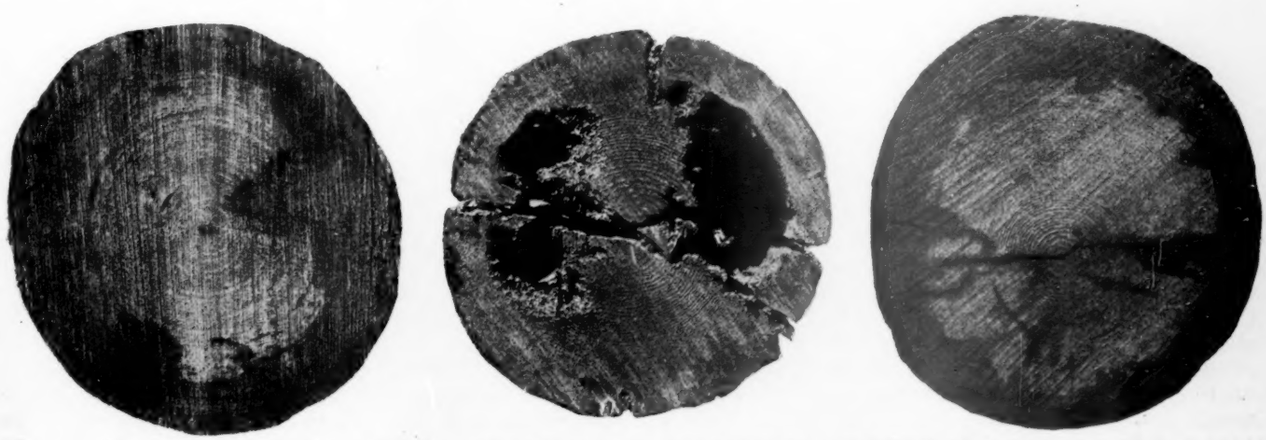
THE PRESERVATION of piling so that 67 per cent were suitable for redriving after 29 years' service in teredo infested waters, is the remarkable record established by the Southern Pacific in its Long Wharf at Oakland, Cal. This structure extends out from the Oakland shore into San Francisco Bay for approximately one mile, terminating in five docks which are used for the transfer of freight between cars and boats. It was originally built of untreated piling but was later rebuilt with creosoted piling, dock "A" being redriven with creosoted piles in February, 1890; dock "B" was redriven in 1898; dock "C" in 1897; dock "D" in 1899 and dock "E" in 1901. It is estimated that over 14,000 creosoted piles have been in service in this wharf for periods ranging from 22 to 29 years.

Because of the expiration of the charter for this structure which could not be renewed because it interfered with plans for municipal waterfront developments, this dock was ordered entirely removed. When wrecking this structure it was decided to examine a number of these piles to ascertain their resistance to decay and to the attacks of the marine borers which infest the waters on the Pacific coast. These piles were of a good quality of Douglas fir and were well seasoned before and after treatment. They were creosoted at the Southern Pacific plant at San Pedro, absorbing 14.17 lb. of creosote for each cubic foot of timber.

The photographs testify to the remarkable resistance of these piles for so long a period of service. The thin shell of treatment around the circumference except where season checks permitted deeper penetration is characteristic of the preservation of Douglas fir. It is noteworthy that this thin shell of timber treatment provided adequately where the timber had not been punctured by accidents or careless handling.

A committee of railway officers and others interested in timber treatment made an examination recently of 600 of these piles which had been withdrawn and found that 67 per cent were in first-class condition, 9 per cent had been slightly attacked by limnoria and teredo, 18 per cent severely attacked and 6 per cent destroyed. A further extensive examination and inspection was made of a number of piles then remaining in the structure. Out of 523 piles examined in dock "C", 333 were free from attack and 74 showed evidence of having been attacked by borers, while 116 were not fit for redriving. An inspection of 1,090 piles in dock "D" showed that 829 were free from attacks, 162 showed evidence of having been attacked, and 99 were unfit for redriving. Similarly out of 2,485 piles inspected in Dock "E", 1,900 were free from injury, 240 showed evidence of attack and 345 were considered unfit for redriving.

The condition of the piles in this structure was so good that the Parr Terminal Company of San Francisco which is now constructing warehouses, ship yards and coal depots on the western waterfront at Oakland not far distant from the Southern Pacific wharf, arranged to use a large number of these piles in its new construction. The United States Government is also using some of the piles from the same structure in wharves which it is building at Goat Island.



Two Sound Piles and One Showing Interior Decay After 29 Years' Service

Railway Developments in Foreign Countries

Several Countries Considering Electrification Projects—British Transport Bill Out of Committee.

THE RIO DE JANEIRO state government has granted concessions for the construction of a steam railroad of meter gage from the port of Manzuinhos, in the district of Sao Joao de Barra, to Porte de Itabapoana, district of Campos. The length is approximately 52 kilometers. Construction must be begun in two years after the promulgation of the decrees, and completed in two more.

Railway Communication Between Lisbon and Paris

According to Lisbon papers, the American Legation has informed the Portuguese Government concerning the scheme for the development of the port of Vigo by an American corporation, together with the construction of the direct railway between Vigo and the French frontier.

Locomotives for Poland

It is reported in Berne that more than 50 German and American locomotives will shortly be sent from France through Switzerland to Rumania and Poland to supply the urgent need for engines in those countries. Rumanian engine drivers have already arrived in France (says a (London) Times correspondent) to take charge of some of these locomotives.

Electrification Considered for Jamaica

The government of Jamaica is reported as arranging to have a survey made of the water power of the large rivers to see if electrification of the railways is feasible. The heavy cost of coal and the necessity of a considerable railroad extension owing to an expected agricultural development explain the proposed change. The local agent of the Westinghouse Company, of New York, is collecting data on which the Westinghouse might tender for laying down the electric railroads.

To Electrify Belgian Lines

Electrification of Belgian railways has been decreed by the Minister of Railways, following a favorable report on such a project made by a committee appointed to investigate such a course, according to a press despatch from Brussels on June 20. The first line to be electrified will be that from Brussels to Luxemburg, and later the Brussels-Ostend railway. Action to this end probably will be taken in August, with the expectation of beginning the reconstruction work at the beginning of next year.

New Congo Railways

A Brussels despatch to the African World states that the railway from Cape Town to Katanga is to be extended northwards from Bukama to Kibombo along the Lualaba (Upper Congo), and that the construction of the Congo-Nile railway is expected to start shortly. The extension of the railway from Bukama is intended to facilitate traffic between Katanga and the more northern regions of the Belgian Congo. Navigation on the Lualaba or Upper Congo, from Bukama northward for 400 miles presents many difficulties, and steamers take a week on the journey. Bukama is 2,600 miles by rail from Cape Town, via Bulawayo, and this is the so-called Cape to Cairo route. The Congo-Nile railway starts from Stanleyville (at the head of the 1,000 miles navigable stretch of the river from Stanley Pool), and will go to Mahagi, on Albert Nyanza, or alternatively to Lado, on the Upper Nile.

Belt Line Around City of Mexico

Plans have just been approved by the Mexican government for the construction of a belt line of railway around the city of Mexico. It is stated that the survey for the proposed road has been made and that the route circles the Valley of Mexico, it being one purpose of the line to afford connection with all of the principal suburban towns and many outlying industrial plants. The government authorities also believe that the road will prove of great military service in the matter of affording means for the quick and easy movement of troops from point to point around the capital.

Mexico to Lease Fifty Locomotives

The commerce department has received from the American consul general in Mexico City, the following statement, which was published in the "Excelsior" of that city:

"The president of the republic has just authorized the director general of national railways to complete arrangements with an American railroad company for the lease of 50 locomotives for service within Mexico. It is stated that some time ago the government received an offer from the abovementioned American company for the rental of engines, instead of their sale. This plan was favorably considered on account of its economy, meaning, as it does, a saving of several millions of pesos.

"Orders have been sent to the purchasing agent of the Mexican railways in New York instructing him to sign the contracts in question. In view of the great need at present of engines it is hoped that, within a month after the completion of these arrangements, the locomotives will be on hand."

Electrification of Railway in Brazil

Recently a director of the Central of Brazil Railway, Government owned and operated, presented to the Minister of Communications plans for the electrification of the suburban lines of the road and the trunk line from Barra to Pirahy, as well as general plans for the suburban service and the closing of the roadbed from the main station to Deodoro, writes Commercial Attaché J. E. Philippi, Rio de Janeiro.

The Commission chose the type of high tension, continuous current for the suburban service, and recommended that the current be purchased from one of the existing power companies rather than have the company install a plant of its own.

The approximate cost of the rolling stock, substations, aerial lines, etc., is estimated at $4,307,377. This does not include the cost of car sheds at the main station and at Deodoro.

The first work to be undertaken will be fencing in and raising the level of the track in order to avoid accidents. It is believed that by closing in the lines the revenues of the suburban service will be greatly increased, as such a step will facilitate a better fiscalization of the passenger receipts. This work will probably cost about $1,398,238, the estimate being based on the prevailing prices of materials.

The director added that in case the total amount required

for this work was not available during the present fiscal year, it would at least be well to begin the work of closing the line, as a half million dollars was appropriated for this purpose in the budget law for this year.

Upon receipt of the plans, the Minister of Communications approved them and directed that the work of closing in the line from the central station to Deodoro be initiated.

Manual Versus Automatic Block Signals

(From the Railway Gazette, London.)

The visions which enthusiasts over American operating methods, after a visit to the United States, had of our lines being protected by automatic signals, and signal boxes and signalmen dispensed with, have never materialized. Conditions in the two countries differed and were not exactly comparable. The main reason for automatic signaling being adopted and making progress in the United States was the scarcity of labor for signalmen, while a factor which led to the growth of automatic signalling was that the concurrent interlocking of the points was ignored. Here, on the contrary, labor was plentiful and cheap; moreover, points and signals on passenger-carrying lines had to be concentrated and interlocked. The compelling argument against any change was, however, the fact that, different to the almost universal condition in the United States, our lines were already signalled—the signal-boxes, signals and signalmen were established. Added to these difficulties in the way of introducing automatic signalling into this country was another, less tangible but harder to overcome. This was the conservatism of the British operating officer. Put before him the suggestion that an intermediate signal-box be closed and replaced by automatic signals and he would at once express his surprise at the suggestion. How useful that box would be in the event of a breakdown! And, proceeding, he would point out that a signalman could see that the tail-lamp was on a passing train, that no passenger was giving signals of alarm, that no loads had shifted and that there was no fire in the train. The fact that an automatic signal would work all night and all day Sunday without extra pay, required no holidays or relief, was never asleep, did the work cheaper than a man and never made a mistake, was not allowed to favor the substitution of the frail human agent by a reliable machine.

The situation is now, however changed. The payment of higher wages to signalmen, the introduction of the eight-hour day and other costly improved conditions of service are making the situation as to the cost of labor more comparable with that to be found in the United States. Consequently some of the objections that led to the rejection of automatic signaling no longer have the weight they had. This is so obvious that there is no necessity for us to labor the point, nor equally, at this present day, is it necessary for us to indicate how the provision of automatic signals would allow for, we should say, one-third of the signal-boxes in this country to be closed either wholly or in part. All those at busy stations and at junctions must be retained, but those where the main duty of a signalman is to put trains "in block" and where not more than a dozen trains have traffic to attach or detach in the 24 hours could, we submit, be closed except when it is necessary to switch them in for traffic purposes. Where, in particular, we think such automatic signaling might be introduced first is on the many stretches of "direct" line opened within the last 15 or 20 years over which there is little local traffic and, consequently, no other work for the signalmen to do than to put the trains "in block."

Automatic signaling differs from that manually operated in that the distance between the signals, and, therefore, the length of the sections, is governed by the placing of the signal-boxes, which are, in the main, determined by other conditions—the locality of a station or a siding—which bear no relation to the volume of traffic, which latter should be the ruling factor. Given automatic signaling and the sections may be of the best length to suit the traffic. Again—and this is important—they can be varied to suit any changes of speed due to varying gradients or the approach to busy centers. Thus, there is obtained fairly uniform running, which is a valuable factor. More than this is gained. Traffic is got over the road quicker. This will be a more valuable asset in the future than in the past, because (*a*) consignments are more costly and all time they spend in travel is capital lying idle; (*b*) locomotive power and rolling-stock are dearer, and the shorter the time per journey the more got out of them; (*c*) the earning power per mile will be increased. In making these claims for automatic signaling we are, we admit, conscious of the fact that in order to win success there must be terminals to suit; it is no use speeding up trains if there be no accommodation at the end of the journey to receive them. This, however, is another story and one that cannot fairly be brought in to condemn automatic signaling.

An advantage we enjoy in urging the adoption of our proposals is that we are recommending something that is an acknowledged success. It may be true that, beyond their use on the rapid transit lines of London, there are but two installations of automatic signals of any length in this country, but these two examples alone are sufficient to secure wider use now that the greater necessity has arisen. We believe that we are safe in saying that the automatic signals between Alne and Thirsk on the North Eastern Railway have postponed the widening between these points, and that had the automatic signals between Woking and Basingstoke on the London and South Western been provided earlier, the conversion of the two lines there to four might have been delayed.

Electric Traction in Belgium

There is probably no country in Europe where railway electrification would be a more paying proposition than Belgium, says the Railway Gazette (London). In view of the large amount of reconstruction work that will have to be done on the railways in any case, the opportunity is a good one for considering whether it is wise to spend money on restoring the steam system. Electric traction has made considerable progress even during the war, and the results of working for several years on the larger schemes in America are now available, especially on that very interesting passenger and express line of the Chicago, Milwaukee & St. Paul. Whatever advantages the single-phase system might offer on a long line, such as the Paris-Marseilles, for a compact area like Belgium, the high tension d.c. system would seem just the thing. We see an announcement in a contemporary that it is proposed to adopt the single-phase system, experimentally, on the Brussels-Antwerp line. In the light of all the most recent experience in electric traction, Belgium would hardly appear to be the country where the system would show to the best advantage. Equally important is the fact that if this single-phase system, which the Germans made specially their own, is adopted in Belgium, it is bound to prejudice the British manufacturer.

Four Electric Locomotives for the Swiss Federal Railways

Following a conservative experimental plan, the operating officials of the Swiss federal railways ordered four different types of electric locomotives, two of which have recently been put in service. Two were ordered from the Ateliere de Construction Oerlikon of Oerlikon, Switzerland, and two from Brown Boveri & Co., Ltd., London, England. Each company was to supply one passenger and one freight locomotive. The mechanical parts of all of the four locomotives were supplied by the Swiss Locomotive & Machine Company,

Winterthur, Switzerland. The Oerlikon locomotives have been delivered and tested on the Loetschberg Railway.

All of the locomotives are designed to operate from overhead trolleys carrying 15,000-volt, single-phase power. A point of particular interest in connection with the design of these locomotives is that the same general method for transmitting power from the motors to the driving wheels is employed in all of the four designs. The motor pinions engage gears on jack shafts, which in turn are connected to the driving wheels by side rods. The side rod arrangement on the Oerlikon locomotives is quite different than that on the Brown Boveri locomotives. The two Oerlikon locomotives are of the 2-6-2 and 2-4-4-2 type, and weigh 91 and 113 tons, respectively. The two Brown Boveri locomotives are of the 2-4-4-2 and 2-6-6-2 type, and weigh 118.5 and 133.5 tons, respectively.

Chilian Railway Development

The lamentable condition of the Chilian State Railway system, writes George Mallett to the Weekly Bulletin of the Canadian Department of Trade and Commerce, Ottawa, is now universally recognized as being responsible for serious delay in the natural progress of the country. The industries and developing interests are not supported by the necessary railway service, which is practically doing (with difficulty) what it was expected to do some 10 or 15 years ago.

Without the advantages of the necessary modern innovations, there are serious deficiencies in the ordinary indispensable rolling stock, which the general management is absolutely unable to replenish from year to year, owing to the difficulty of making both ends meet. Now with a deficit on the annual budget amounting to $8,000,000 in the face of a national crisis, it is realized that a loan is necessary to place the system in a position to earn expenses and to assist in the development of the nation's trade and industry.

The amount of this loan has been fixed at or about $32,000,000 which it is proposed to distribute as follows: $3,700,000 on the electrification of the first section (Valparaiso to Santiago), $2,400,000 for electric locomotives, $1,820,000 for cost of double lines, $1,200,000 for reconstruction and reinforcement of bridges; $1,000,000 for new branch lines and sidings; $6,600,000 for buildings; $3,100,000 for workshops; $5,200,000 for the purchase of equipment; $1,500,000 for signalling system and points service; $1,120,000 for automatic brakes, $800,000 for mechanical coalers, bunkers, etc.

The British Ways and Communications Bill Out of Committee

[From the *Railway Gazette*, London.]

After being under discussion for 18 days, covering the period from April 1 to May 28, the Ways and Communications Bill has emerged from the committee stage practically unaltered. Despite the strong attacks made by dock, harbor and road authorities they are still included; notwithstanding the powerful arguments that a system of bureaucracy would be installed the powers of the Minister remain unaltered except to the extent that he is to have advisory councils—whose advice he is not, however, bound to follow—and though several speakers found much virtue in the privately-owned railway wagon its sponsors failed to get much support. Numerous concessions, naturally, were made as the proceedings progressed, but once only was the government defeated.

On May 6 the clauses relating to the Advisory Committee as to any revision of rates, fares, tolls, etc., were agreed to. Later in the proceedings other advisory committees were proposed and then—May 13—the Home Secretary, in opposing the addition of further bodies, said that there was a provision in the bill that if injury or loss were caused to undertakings compensation would be paid. There could be no compensations to the public in regard to revision in rates, and it was for that reason that a statutory advisory committee had been given in that case.

On May 6 the government escaped defeat by 18 votes to 17 only on a proposed amendment that, without the consent of any harbor, dock or pier authority, no part of an undertaking should be taken possession of unless the whole were taken. The following day an amendment that the Minister be responsible for the acts and defaults of his servants was accepted, also a provision that the expression "transport services by water" should not include any services that could not be established under existing statutory powers—this disposed of the inclusion of coastwise shipping.

On May 13 a debate as to further advisory councils occurred. Sir Eric Geddes was willing to have such committees "for giving him advice and assistance in connection with such matters affecting the exercise and performance of his powers and duties as may be referred to them by the Minister," but Joynson Hicks would make the reference to the committee compulsory. Sir Eric proposed a modification, but this was rejected by 21 votes to 19 only to be followed by Joynson Hicks' amendment being itself rejected by 22 to 20. All that day and the following Sir Eric Geddes' new clause was discussed, and eventually "a panel of experts" was accepted, also the provision that "Before exercising any of the powers under Section 3 (1) (b) or directing the establishment of new transport services by land or water the Minister shall, provided he considers the question involved to be one of sufficient importance to justify such a reference, refer the matter to a committee selected by him from the said panel." Even to this wording some amendmends were made on May 15.

On that date a new clause was brought up, and read a second time, authorizing the Minister to establish and work transport services by land or water, provided that (1) if the establishment of any such service will involve an original capital expenditure exceeding £1,000,000 an Order in Council, approved by both Houses, would be necessary, and (2) "where it appears to the Minister that the establishment of any such service could properly be undertaken by the owners of any existing undertaking the Minister shall not himself establish the service without first giving to such owners an opportunity of establishing the service. . . ." On May 20, a brief sitting was devoted entirely to a new clause as to the transfer of officers and servants. This covered three points. First, the pensionable rights of an officer or servant with a railway company were to be protected during the two-year period in the event of his transfer to the Ministry; i.e., if the railways reverted to the companies after the two years the man would be in the same position as though he had been continuously in the particular railway company's service. Second, no man should be permanently transferred to the Ministry without his consent. Third, for a temporary transfer the consent of both the railway company and the man was necessary. It is provided that the consent should not be unreasonably withheld, this being necessary in order to prevent a man refusing reasonable work and then claiming compensation for having lost his position. Little of interest happened the following day, but on the 22nd the compensation clause was settled. The question of the privately-owned wagon was discussed later and the following conclusions reached: (1) authority for purchase has to be obtained by an Order in Council, the draft of which has to be approved by both Houses; and (2) that England and Wales, Scotland and Ireland are separated in this matter but, if, in any one of these divisions, wagons used for the conveyance of any particular class of traffic be purchased all wagons so used in the division affected must be purchased.

June Meeting of the Signal Division, A. R. A.

Handling Trains by Signal Indication Without Orders; Contracts and Other Problems Considered

THE JUNE STATED MEETING of the Signal division of the Engineering section of the American Railroad Association was held at the Breakers hotel, Atlantic City, N. J., on June 26 and 27, with 125 active and junior members, 97 associate members and 48 guests in attendance. R. E. Trout (St. L.-S. F.) chairman of the division occupied the chair and H. S. Balliet (N. Y. C.) acted as secretary of the meeting.

R. H. Aishton, regional director of the Northwestern region, United States Railroad Administration and president of the American Railroad Association addressed the meeting on Tuesday morning. Mr. Aishton said in part: "I want to have a little get-together talk with you. I have been a member of your Association for a good many years and I am glad I have been, because I get your proceedings and all the literature you put up. It has been a liberal education for any railroad man and particularly for me because if there was phase of railroad work that I knew nothing about, even though I was a president, it was the signal business. I am familiar with the work you have done. In the matter of standardization alone your Association through deliberations such as are going on here, and often given but little encouragement by the railroads in the past has achieved marvelous results. You have a large number of standard prints and plans and in that direction you have done a great deal in bringing the railroads together.

"There is a tremendous field before you. As I understand it, fully 80 per cent of the railroads in the United States are today taking your dictum as law. If you recommend a thing they take it. I desire to say to you that the underlying thought of the American Railway Association is to make that 100 per cent. I notice that your presiding officer said at the last meeting 'the same old scrappers will be in evidence.' I want to tell you that the scrappers in an association are the ones that make it. One time in the old American Railroad Association we had a fight in the old train rules committee over inviting members of the Train Despatchers Association and the Signal Association to come in and talk to us on some technical points involved. The western idea prevailed and the men were finally called in. Ever since that time they have taken a prominent part in the various matters that come up before the Association."

Speaking of the railroad situation Mr. Aishton said: "We have a pretty hard job ahead of us. But as I look ahead it looks a little different than it did a year or two years ago, the roads are going to be a little bit different and there must be more coordination. There must be more standardization as between railroads and a closer working together on their part. At present the government exercises a big power, and it has been for good. The things accomplished on the railroads during the war could not have been accomplished under private management, simply because you could not coordinate the resources of the entire community, doing the things absolutely necessary in winning the war and so there can be no criticism of what the government has done. But when government control lets go, where are we going? Are we going back to the place we were before? In my opinion no, and I believe this Association and these various sections of the A. R. A. all working together and coordinating, will make a better and more economical transportation machine. A better transportation machine is going to be the one power in the United States that is going to stand between the railroads and government ownership because if railroad men do not control this situation and do not run our roads in the most economical manner to afford the best service to the public, there is only one alternative, and that, in my opinion, is government ownership."

The secretary made a short report on routine matters and explained that due to the labor situation and other causes it had been impossible to mail out the advance notices containing the committee reports prior to the time of the meeting.

The most interesting discussions of the meeting were brought out by the reports on the location of take-siding indicators and upon the standard form of contracts. A variety of opinions were expressed as to the proper location of a take-siding indicator and also as to whether it should be connected with the signal system or considered as an entirely separate adjunct. When the standard form of contract was presented for discussion the manufacturers entered a strong protest against the adoption of the clauses covering risks and indemnities. It was stated that no indemnity company would insure the contractor at any reasonable figure where he is made responsible for consequential damages.

COMMITTEE REPORTS

The first report discussed was that of Committee No. 9—Wires and Cables. W. H. Elliott (N. Y. C. Lines East) chairman of the committee submitted an oral report on the testing of tape in using various size mandrels and stated that it was the intention of the committee to use a ¼-in. mandrel on which to wind tape. It was found that a certain amount of flow in the compound affected the rate of winding and unwinding. This committee expects to present recommendations to the September meeting.

Committee No. 5—Maintenance and Operation, L. R. Mann (M. P.), chairman, submitted a short report on methods of handling trains by signal indication without train orders and the preparation of rules and regulations for signal maintainers. This committee has previously submitted a report on the first subject for single track operation while this report refers to double track operation. The committee said in part: "The operation of trains by signal indications, without the use of written train orders, although practiced on but a relatively small mileage in this country, possesses important advantages which appeal to students of railroad operating problems. It is well understood that under the old train despatching system a good deal of time is lost in slowing down or stopping trains for the issuance of orders. In these days of heavy traffic and other difficulties, in the efforts to secure the largest possible tonnage movement it would seem well worth while for managements to study the advantages of operation by signal indication without written train orders. Automatic block signals promote safety of operation and expedite traffic, but the highest efficiency with such signals is not realized where the train despatching system is retained in the old form. Not only is time lost in slowing up and stopping trains for orders but orders cannot usually be issued at passing tracks and cross overs that lie between train order stations, under the old form." The report on this subject was accepted as information. The committee decided to prepare examination papers with questions and answers based on the rules at present in the R. S. A. manual; any additional rules which may be deemed desirable by the sub-committee to which this subject has been assigned, will be called to the attention of the entire committee. This was accepted as a progress report.

Committee No. 8—Alternating Current Automatic Block Signaling, C. H. Morrison (N. Y. N. H. & H.) chairman, deviated somewhat from its assignments and revised the general provisions, standard sections and general electric requirements and brought up-to-date unit specifications previously submitted and printed in the manual for, as the advance in alternating current signaling has been rapid, it was deemed necessary to bring these specifications up-to-date. In addition the committee submitted a specification for position light signals and also one for color light signals. Considerable discussion arose over the wording of a number of the clauses as certain standard clauses differed from the wording in other specifications. Finally a motion was made and passed that the Committee of Direction appoint a committee to standardize clauses and phrases. It was further moved that the specifications, after revision, be submitted to letter ballot at the September meeting. It was recommended by the committee that the specifications for alternating current electric generators be withdrawn from the manual as a revised specification for alternators covers this subject. The committee also recommended that the specification for single-phase track transformers, 250 volts or less, be eliminated from the manual as this is also covered in other specifications. On a vote these recommendations were carried.

Signaling Practice

Committee No. 10—Signaling Practice, J. A. Peabody (C. & N. W.), chairman, submitted a report on only two of the subjects assigned to it. The report on automatic train control consisted of a list of references on this subject, prepared by the Library Bureau of Railway Economies. The other subject reported on was divided into two parts, (1), the application of aspect indicating that train must take siding at a non-interlocking switch, (2), the application of aspect indicating that 19 or 31 orders are to be delivered. A questionnaire was sent to all the signal engineers of the country and the following questions were asked with reference to the application of aspect indicating that trains must take sidings at an non-interlocked switch:

(1) Is the proper location of the take-siding indicator at a point not less than braking distance from the switch, in connection with whose approach it is used? Answer: Yes, 11; No. 4. Recommend locating take-siding indicators at switch, 17.

(2) If it is convenient to apply the take-siding indicator to an existing signal, shall the signal under which it is applied be caused to display a stop, approach or clear indication when the indicator is displayed instructing train to take siding, or shall this be left to the discretion of the signal engineer to arrange the control according to the local necessities? Answer: Recommend signal above indicator stop, 17. Left to discretion of signal engineer, 6. Recommend signal above indicator indicate proceed, 4.

(3) Shall the signal in the rear of the take-siding indicator be caused to display an approach indication when the indicator is displayed instructing trains to take siding? Answer: Signal in the rear to display caution, 25; non-commital, 8; roads not using take-siding indicator, 35.

Three questions were asked with regard to the application of aspect-indicating what 19 or 31 orders are to be delivered.

Question (1) What aspect is used for the transmission of information that 19 or 31 orders are to be delivered?

Question (2) Is the same aspect used for both?

Answers to questions 1 and 2: (a) Home interlocking or station signal at stop for issuance either of 19 or 31 orders, 37. (b) With lamp or flag displayed in addition thereto, 14. (c) Answers non-commital, 6. (d) Signal displayed at 45 deg. for issue of 19 orders, 10. (e) Signal wigwagged until acknowledged by engineman for issue of 19 orders, 2. (f) Signal at 45 deg. for issuance of caution cards, 1.

Question (3) Do you consider it essential that different aspects be used to indicate issuance of 19 or 31 orders?

Answers: Yes, 21; No, 20; non-commital, 16.

It is the practice on the Baltimore & Ohio to locate a take-siding indicator on the signal governing the switch. If the signal is located at the switch the take-siding indicator is located on it. The signal displays stop while the signal in the rear dsplays caution. If the indicator is located on the signal 1,000, 2,000 or 3,000 ft. away from the switch, the signal above then indicates caution and the signal in the rear also indicates caution. At night a reflected light is used on the take-siding indicator.

On the Erie such an indication is placed approximately 200 ft. in advance of the switch governed and is fixed on the mast above which is an automatic signal. The lower arm is caused to indicate a 45 deg. position by the operator and the top arm then indicates stop.

In the discussion F. W. Pfleging (U. P.) expressed his belief that the take-siding indicator should be placed at the switch with a distant indication. If no distant indication is used it should then be placed at not less than breaking distance from the switch. A. H. Rudd (P. R. R.) considered it a very great problem to determine whether a take-siding indicator should be linked up with the signal system or not and its solution was a very important matter. After the discussion the subject was referred back to the committee for further consideration.

With reference to the aspect indicating that 19 or 31 orders are to be delivered, C. A. Christofferson (N. P.) stated the practice on his road is to give an engineman advance information in automatic signal territory while in other territory a 19 order is indicated by the 45 deg. position of the board.

F. W. Pfleging (U. P.) said that in over 2,200 miles of automatic signal territory the Union Pacific has been using 19 orders for making meeting points for seven years. The 31 orders are used for signing for timetables. Trains to be run against current of traffic are stopped and run on 31 orders. The trains order boards are operated on the normal danger plan and the engineman has to whistle for the signal. A. H. Rudd (P. R. R.) stated that the practice on his road is to hold the block signal at stop and display the order flag or light until the train acknowledges the order board and stops, then the signal is cleared.

A. R. Fugina (L. & N.) said that on his road a normal danger train order signal used independent of the automatic signal system and the train orders boards. The enginemen are required to whistle for the board. About ten years ago they began to make a practice of using the home signal at interlocking plants as the train order signal but a majority of the operating officers were in favor of a separate signal indication for this purpose. In manual block territory a four-arm signal is used, the two top arms governing the block while the two lower arms are used for train orders. A 45 deg. position of the train order arm indicates a 19 order. The report was accepted as information.

Committee No. 6—Standard Designs, F. P. Patenall (B. & O.), chairman, presented three new drawings covering a standard switch lamp, train marker lamp and highway crossing gate lamp. The meeting adopted for submission to letter ballot a design for a switch lamp (cylindrical type). A design of train marker lamp was referred back to the committee after additional information had been received from the meeting. The drawing of the highway crossing gate lamp was also referred back to the committee for further consideration and it was suggested that the committee consider the use or design of a spring on the lamp or handle to prevent the light from being jarred out. It was also suggested that a 5⅜ in. lamp be adopted instead of the 4 in. one and that a hanger should be designed for use on the gate to which the lamp is attached.

The Second Day's Session

Committee No. 7—Direct Current Relays, E. G. Stradling (C. I. & L.) chairman, submitted specification for lifting

armature, neutral type, direct current relays. There was a long discussion over paragraph 2-6, page 189 of the June Journal reading "All moving parts shall be inclosed in a weather-proof dust-proof case, the sides of which shall be of glass of such transparency that the parts within the case may be visible for inspection. A screened breather opening, in the base of the case, adaptable for closing shall be provided." The discussion hinged over whether a relay should be allowed to breathe.

F. W. Pfleging (U. P.) said that in certain mountainous districts on his line extreme changes of temperature occurring in a period of a few hours made relays sweat, causing quite a little water to collect in them. This matter was taken care of by proper ventilation of relays. In other sections where considerable rain existed this trouble was not experienced.

E. W. Kolb (B. R. & P.) said that the breather opening was not for ventilation but was provided to equalize the pressure of air inside the glass case to that existing outside and that it was due to an unequal pressure between the two sides that caused the gasket to allow water to work into the relay. F. L. Dodson (G. R. S. Co.) said that some of his customers preferred to have relays incased air tight.

The wall type is not adopted to the construction of the breathing apparatus, as proposed.

W. H. Elliott (N. Y. C.) has 40,000 wall type relays in wooden cases with no special provisions for ventilation and has had no trouble from water. After many expressions of views F. P. Patenall (B. & O.) moved to eliminate the paragraph requiring a "breather" but the motion was lost by a large majority.

Paragraph 6-b, on page 190, of the June Journal reading "a non-adjustable stop-pin of phosphor bronze shall be placed under each core near the edge furthest from the bearing, protruding .010 in. from the underside of the core or the upper side of the armature for safety purposes" produced considerable discussion. Mr. Dodgson felt it would be a mistake to put this back in the specification as moisture condensing on these pins and cores would allow the armature to freeze fast during cold weather, causing a false clear signal indication. E. G. Hawkins (N. Y. C.) felt there was a necessity for two stop pins to maintain a proper air gap because the trunnions of the relays cannot be relied on to remain as they were when first installed. After relays are old the trunnions become worn so that an unequal bearing or pull may take place.

The chairman moved that the report be accepted as a progress report and the motion was carried.

Standard Form of Contract

Committee No. 12—Contracts, R. C. Johnson (B. R. T.) chairman, submitted a standard form of contract for execution with the contracting signal company for the installation of interlocking plants and block signals. G. A. Blackmore (U. S. & S. Co.) presented a strong protest against the adoption of a clause making the contractor responsible for consequential damages, stating that no indemnity company will insure the contractor at any reasonable figure, for such vague liabilities. No contractor can take such a risk; but a railroad, being a large concern, can establish contingent funds which will cover all risks. As the clause is drawn, a single accident could bankrupt the largest signal company. W. J. Gillingham (Hall Switch & Signal Company), S. G. Johnson (General Railway Signal Company) and Paul Renshaw (the Federal Signal Company) concurred in Mr. Blackmore's statement and argument. The representatives of the manufacturers seemed to think they had not been accorded proper recognition, but Mr. Elliott, speaking for the committee, said that a full conference had been had with them. The members of the committee had been guided largely by the law officers of the railroads; and their proposals were similar to those in the forms approved by the American Railway Engineering Association. It was stated that the New York Central has experienced no difficulty in getting work done under its form of contract, which is fully as rigid as that proposed by the commmittee.

To the argument that this form was similar to the forms used by contractors for the kinds of work done for railroads, Mr. Johnson replied that the conditions are not parallel; a signal company comes in at the end of the work and has to incur varied dangers because trains are already in operation. Mr. Rudd (P. R. R.) thought Mr. Johnson was rather one-sided, but, he said, the committee has learned the other way and the clause ought to be rewritten.

There was objection to the clause providing for the imposition of a penalty for delay; the general view being that no railroad uses this. The committee had put this in so as to provide a suitable form of words in case the condition should be desired but, Mr. Johnson said, this will encourage some obscure road to insist on the penalty when otherwise it would not have been thought of.

Objection was made to the sweeping character of the paragraph providing that omissions on plans or on specifications should not prevent the purchaser from getting all that was reasonably required; and the meeting finally voted, by a large majority, to cut out the words "or anything not expressly set forth in either plans or specifications, but which nevertheless is obviously necessary or implied."

The report was accepted as one of progress, including also a clause, not printed, requiring the contractor to guarantee not only his own apparatus but any provided by another contractor, or by the railroad company. In this connection Mr. Blackmore felt it unfair for one contractor to guarantee the reliable operation of apparatus manufactured by other contractors when this apparatus was furnished on the express instruction of the purchaser.

It was moved and carried that the report be accepted as a progress report.

D. C. Automatic Block Signaling

Committee No. 4—Direct Current Automatic Block Signaling, C. F. Stoltz (C. C. C. & St. L.) chairman, presented, as information, a proposed specification for direct current motor-operated signal mechanism. After brief discussion this was accepted; also a sketch, on a loose sheet distributed to the members, showing a proposed connection from rail to bootleg which has been developed on the Louisville & Nashville. Mr. Rudd (Penn.), is using in alternating current signaling, a ¼ in. sash cord connection. This has proved quite satisfactory. This connection can be hit with a pick several times and yet not be damaged. G. H. Dryden, a member of the committee, thought the proposed design lacked flexibility, for trackmen cannot be made to renew joints without changing the location, sometimes three or four feet, one way or the other. The connection to the rail ought to be made three or four ties away from the joint, and then follow along the rail as shown in the drawing. Mr. Eck (Southern Railway), thought it very desirable to have connection on both sides of the rail. He uses capping of design similar to that shown by the committee. Mr. Fugina (L. & N.) asked members to consider this arrangement with a view to trying it; he desires to learn the results of more extended experience. The sketch was received as information.

Committee 16—Standard Clauses and Sections is a new committee appointed by the Committee of Direction. It will be the duty of this committee to standardize the various clauses and sections in the different specifications as adopted by the association. F. B. Wiegand, signal engineer, New York Central, Lines West, was appointed chairman. W. J. Eck, signal and electrical engineer, Southern Railway and F. P. Patenall, signal engineer, Baltimore & Ohio, were the other two members appointed.

Committee No. 11—Batteries and Switchboards, R. B. Elsworth (N. Y. C.), chairman, presented a specification for primary battery jars, consisting of eight paragraphs. Some of these paragraphs were discussed briefly and were left in the hands of the committee for further conference with the manufacturers. This specification provides that the jars shall be furnished in multiples of the contents of a standard package. Small packages, although costing more than large packages for the same number of jars, are economical in the end by saving repacking in making shipments from the storehouse to the field. The committee proposes that, for testing, the rule shall be one jar in 10 or two in 20.

Instructions for the installation and handling of caustic soda batteries, presented by this committee were discussed at some length. Clause 2-c provides that cells or parts should not be unpacked except as required for use. This was criticised as interfering sometimes with economical handling. Some railroads check material before paying for it; others must unpack because of fire risk.

The rule for setting up new cells refers to the standard jar; but thousands of old jars are in use and there is need of detailed instructions as to right quantity and proportion of solutions for different classes of jars. Mr. Elsworth suggested that committee No. 5 should draft suitable instructions to maintainers.

On motion of Mr. Fugina the meeting voted to eliminate paragraph 7 providing for the use of lamps to keep batteries from freezing in cold weather, the general sentiment being that a rule of this kind needs to be much more detailed. Maintainers are liable to use lamps unnecessarily. After further discussion it was voted to accept this data as information and refer it to Committee No. 5.

Other Reports

Committee No. 2—Mechanical Interlocking, C. J. Kelloway (A. C. L.) chairman, presented a specification for mechanical interlocking machine having improved Saxby & Farmer locking and a specification for locking, establishing uniformity and sequence. After some discussion the report of the committee was accepted to be submitted to the annual meeting for letter ballot and inclusion in the manual.

Committee 3—Power Interlocking, F. B. Wiegand (N. Y. C.) chairman, submitted a report on specification for universal electric motor, switch operating and locking mechanism, first and second range voltage. This had been submitted at previous meetings and consideration has been given to the various criticisms and recommendations made before it has been revised to meet such criticisms and recommendations as, in the opinion of the committee, it thought advisable. The specifications for power interlocking machines were again submitted, after various criticisms and recommendations as made at previous meetings had received consideration. After brief discussion it was moved and carried that the specifications be accepted for presentation to the annual meeting for approval and submission to letter ballot for inclusion in the manual.

How Operating Capacity Can Be Increased*

Terminals Are Limiting Factor. Suggestions for Improving Intermediate Transfer Roads

By E. H. Lee
President, Chicago & Western Indiana, Chicago

IT IS THE OPINION of many well-informed railroad men that the transportation work to be performed by the railroads of the country during the coming winter will be from 20 to 40 per cent greater than that performed last winter, if traffic conditions reasonably to be expected are to be met. This increase is caused largely by reason of the various governmental activities necessary in the work of winning the present war, although the ordinary business of the country is keeping up in surprising volume. The need for fuel is greater than ever, although that portion handled along our eastern seaboard by vessel must now be handled by rail. Prompt deliveries of other war materials in heavy volume are imperative if the work of properly maintaining and supplying our fighting force abroad is to continue. Food materials and products must be moved to the seaboard promptly and troop movements are increasing the demands upon the passenger facilities of the country. It is the purpose of this article to discuss the existing situation on the railroads of the country with a view to determining what can be done within the next four or five months toward improving existing conditions, in order that the railroads may be more nearly able to meet the demands that will then be made upon them.

The transportation work of the country is being handled by the railroads at the present time in greater volume than ever before and with reasonable despatch. It will be remembered, however, that conditions in the summer season lend themselves to maximum transportation effort, whereas during the winter season this maximum effort is necessarily reduced. Congestion on the railways propagates itself rapidly and causes further congestion. In the last analysis congestion is the chief enemy of railroad transportation because it interferes with the one purpose of the railroads—the movement of traffic.

Terminals the Limiting Factor

It will doubtless be conceded that the facilities of the railroads are relatively much greater for handling traffic outside of the more important terminals than within them, and therefore the inference seems plain that in order to secure the maximum improvement, any measures looking toward an increase in their capacity for handling traffic next winter should be directed toward the terminals rather than toward the open country lines.

If prompt authority is secured, yards for the storage of cars may be provided either adjacent to, or at points outside of and beyond important terminals, where land is cheap and construction is easy, and this car storage, if provided, will doubtless be of great value in keeping tracks in working yards sufficiently clear, so that they may be reasonably open for the receipt and necessary classification of business. It seems certain, however, that the only improvements in track facilities which can reasonably be expected to be available next winter within the larger terminals themselves will be

*From an appendix to a preliminary report of the Yards and Terminals committee of the American Railway Engineering Association published in Bulletin 208.

those secured by so-called co-ordination, with the better balanced and therefore more complete use thereby secured. Experience has shown, however, that any rearranged use of existing track facilities should be carefully investigated, and adopted with caution, because many cases have and will occur in which suggested changes are only of superficial advantage and would probably be an actual disadvantage, considering the situation as a whole.

Principal Causes of Congestion

Two of the principal causes of congestion in terminals, which in turn act in a vicious circle with congestion itself, each to cause the growth of the other, are dead time and the rehandling of cars. It is safe to say that any method or practice which secures the maximum reduction in dead time, and in the rehandling of cars, will also secure maximum reduction in the congestion of terminals, and therefore maximum increase in the efficiency of the railroads of the country as a whole.

For the purpose of this discussion, dead time is limited to and may be defined as time spent by the train crew after an engine has been manned, in getting out of the roundhouse, pulling up to and coupling onto the train, testing the air, etc., at the outgoing end of the trip; time lost in setting out and picking up; and time spent in putting away the train, with the various similar attendant operations at the incoming end. This so-called dead time thus defined is to be distinguishable from time spent in actually passing over the road. Its serious effect in terminal operation is not generally appreciated, being of much less relative importance in open country operation than in terminal operation. This is true because dead time remains more or less constant, while running time tends to vary directly with the length of the run. As an illustration, assume an open country division 100 miles long, with the average freight running time over the division eight hours, as compared with a transfer run in a terminal 12 miles long, and an average running time of one hour. If the dead time is in each case two hours, the dead time loss on the country division is only 20 per cent, whereas on the transfer run it is 66⅔ per cent. This comparison may seem exaggerated, but an investigation made by the writer some years ago, which is believed to have been reasonably accurate, disclosed that in an actual case under ordinary conditions and where no undue congestion existed dead time as above defined consumed 65 per cent of the total service time of all trains in transfer service.

Rehandling cars is brought about by a number of different causes. Lack of proper method, as well as lack of careful and intelligent planning on the part of trainmasters, yardmasters, and conductors responsible for transfer movements, is partly responsible, but these causes operate during times of normal movement as well as during times of congestion. The great cause for rehandling is undoubtedly congestion, which is in turn further aggravated by the rehandling itself.

The two chief requisites for the rapid and efficient classification of cars, in so far as facilities are concerned, are sufficient motive power and sufficient open track room. The best results are obtained when these two kinds of facilities exist in a proper ratio. It is well understood that a deficiency in track room may up to a certain point be equalized by a surplus of motive power, but that lack of open track room will not make good a deficiency in necessary active power.

If the foregoing discussion is reasonably accurate as to the facts it may be continued with a view to determining their application and as to what changes may be advantageously made in prevailing methods and practices in order to secure an improvement.

At most minor terminals and junction points, direct deliveries are made between the railroads, and at some points the chief improvement possible is doubtless to be secured by a co-ordination of facilities when practicable, and an improvement in methods, as, for instance, by the reciprocal delivery of cars, thereby eliminating light running. In the case of industries served by more than one line, it has been the general practice in the past for each road to handle its own business into and out of the same, although in one case familiar to the writer all such industrial deliveries have been handled by a terminal railroad for the tenant companies using its line for a period of over 30 years, and with results entirely satisfactory in the way of a reduction of both engine time and cost. Under the new federal operation an arrangement has been inaugurated at various points by which the business of all the railroads to and from a certain industry or group of industries is handled by one company, and this practice may be expected to become general.

On the other hand, in the terminals of many of the larger cities considered as a whole one or more transfer railroads have performed an important part in the process of receiving and delivering cars between the various lines, and these transfer railroads become especially important during times of congestion. The transfer of cars in small terminals and at junction points is relatively a simple matter, and with proper care and attention, on the part of the railroad officers familiar with the conditions, it ought to be put on a more uniformly satisfactory basis. The transfer of cars over a transfer railroad in a large terminal is more complicated, and in view of the difference in the service performed, as between railroads of this kind, an analysis in each case would seem desirable, to determine what changes are needed. One of the broader differences is that some transfer railroads are used entirely for the operation of trains handled by the motive power and train crews of their tenants, while others operate either in whole or in part with their own power and crews. As the more important transfer roads in large terminals are operated in the latter way, what follows in this discussion is considered as especially applicable to them.

Certain principles follow with the reasons therefor which are believed to be particularly applicable to terminal transfer railroads which operate trains with their own power and crews, although some of these principles are of more general application:

Terminal Transfer Railroads

1. The operation of transfer railroads should usually be restricted as much as possible to the transfer of cars as distinguished from the classification of cars. It follows that the through line should so far as practicable deliver its cars to the transfer line, classified and straightened out into cuts for the various through lines to which deliveries are to be made by the transfer line for through line account. Such a transfer railroad as is being considered may be compared to a thoroughfare connecting two camps or cantonments. It may be of ample width to handle all the travel between them, if team and foot travel is kept moving in column formation, at fair speed, and without unnecessary steps, columns having been formed in the streets and areas of the cantonments themselves. But if the thoroughfare is used as a drill ground, for the formation of columns, or as a recreation area, its capacity may be reduced to the vanishing point. The main tracks of most transfer railroads are ample for a larger volume of traffic than is handled over them, but in times of congestion they are frequently blocked at junction points, yard entrances and connections by trains which are unable to get into yards by reason of their crowded condition. These yards, in turn, are congested by an oversupply of cars awaiting classification, which occupy room that should either be reserved for the receipt of main line

transfer trains or be kept for the classifications which are necessary and which cannot be made to advantage elsewhere.

It should be observed that where through lines make direct deliveries to each other, they classify cars straight for the various railroads as a matter of course. There seems no good reason why when delivery is made through the agency of a transfer line the through line should not continue to make the required classifications, at least to a reasonable extent. In so far as the through business is concerned, it is believed that the practice of considering and using the transfer line as an agency for both classification and transfer, instead of restricting its use so far as practicable to the transfer of cars, is responsible for much of the congestion of terminals. The present practice has been the growth of years. Until recently the transfer road depended upon the through lines for much of its business, and felt in no position to object to the dumping of business upon it regardless of congestion or of how badly the deliveries might be mixed. Under the old conditions the responsibility of the through line ceased, once it had delivered its cars to the transfer or belt line, and every effort was accordingly made (the more congestion increased, the more strenuous the effort) to unload on the transfer line, regardless of ultimate consequences, thus "shifting responsibility."

With flat switching ordinarily eight or ten classifications are made without rehandling, a greater number being bunched and reclassified. An analysis will show that in very many cases only few classifications are required to straighten out a large proportion of the business. In one case in Chicago about 50 per cent of the through transfer business in one direction goes to only two railroads. If all cars for these lines were delivered to the belt line in straight cuts, approximately 50 per cent of the classification in that direction would disappear and much of this 50 per cent could be run in straight trains from terminal to terminal, thus eliminating dead time and helping to keep yards clear. Moreover, this preliminary classification could be made with little or no additional expense by the through line, because it must in any event switch out many cars, such as bad orders, holds, and those for other deliveries. Also a considerable amount of this preliminary classification could be done to advantage at the division yards of the through line beyond the large terminals.

The place to control congestion is at or near the various points where business originates. By proper measures the through line may in a degree control congestion in its own important terminal yards, by holding back business, something impossible to the belt line, without the help of the through lines.

Business moving even in heavy volume is not congestion, and where they exist, belt lines if kept reasonably open and uncongested are the best means of keeping cars moving in terminals, thus avoiding congestion and blockades.

Preliminary or advance classification as above described is not a theoretical measure, but has been used many times with success to prevent and to lift blockades in terminals.

2. Where transfer or belt roads are of considerable length and where equipped with motive power to handle transfer trains, it is the better practice to keep foreign engines off the belt line, performing the transfer service with belt crews. Better supervision can be secured where train crews are kept at home. It is difficult, if not impossible, to enforce discipline over crews while operating on a foreign road (particularly against loafing on the job), even though in theory they become the employees of that road while so engaged. Moreover, discipline and standards of performance vary on different railroads, being better on some and worse on others. Where foreign trains and engines operate over a transfer road it ordinarily happens that the general movement is regulated by the slowest and most indifferently operated train. There is also a difference in the standard of power maintenance as between railroads. A stalled train caused by the engine breaking down, not steaming or being overloaded, delays all following trains, and if a foreign crew, the railroad officers who should apply discipline have no direct stake in the failure, and find excuses ready to hand. The practice of using foreign crews on the transfer road is not sufficiently elastic. The crew may have a full train in one direction and a light train in the other, because it runs between two points only. The belt crew may be ordered to any of several points, as the business may indicate.

3. Trains should be so made up that one engine will handle as many cars as far as possible. This principle is used in the operation of through lines very generally. Under the new federal operation trains of war material have been consolidated and run solid over several different railroads without breaking up, with a saving of time and expense. The application of the principle on transfer railroads is even more important than on the through lines, because it is one of the best ways of reducing dead time, which, as we have seen, cuts so much more figure on the belt line than on the through line.

4. Where track facilities permit, the through line engine should make deliveries to the belt line yard and should haul back its own deliveries from the belt line yard. This eliminates light running. It also fixes responsibility, something of great importance during times of congestion because it permits the prompt application of the remedy. This presupposes that the belt line has sufficient tracks for both its receipts and deliveries, which will doubtless be true in most cases, where its yards are kept properly clear. As the receiving road controls its own receipts, this arrangement would give control of both receipts and deliveries to the belt line, because unless the through line keeps its receiving tracks clear by taking its business, the belt line can shut it off, and this is as it should be.

5. Transfer trains should be loaded to capacity so far as practicable, because a light train costs about as much and occupies the track facilities to about the same extent as a full train, while handling less cars. No discussion seems necessary of this rather obvious principle, although it is not always carried out in practice.

As will be observed, the foregoing discussion is largely directed toward an improvement in the operating methods of an intermediate transfer railroad. How important transfer railroads of this type are to the business of the country is shown by figures prepared by the writer in 1915 regarding one of the Chicago belt lines. With a roadbed mileage of only 0.012 per cent of the mileage of the whole country, it handled a tonnage equivalent to 1.03 per cent of the total tonnage of the country. Bearing in mind that terminal congestion retards the flow of traffic for long distances outside the terminals as a dam cuts off the flow of water for miles above it, the vast importance of removing congestion and promoting the flow of traffic through terminals becomes apparent.

Conclusion

It may also be observed in conclusion that some of the improvements suggested as applicable to belt or transfer railroads, will be found of equal advantage in connection with the work of terminal divisions of some of the larger systems.

The three things among those suggested in this discussion which it is believed would have especial effect in controlling congestion are the construction of storage yards, outside the terminals; the advance classification of transfer cars, to the greatest practicable extent; and an extension of the authority of the men in charge of terminal operations, whatever their rank or title, in order that they may better control the flow of traffic to and through the terminals.

One Way to Improve Operating Methods

By Max E. Burk

WHETHER OR NOT the railroads are to be operated by our government; whether or not government ownership of railroads is to be our policy; whether or not the railroads are to be returned to their original owners for operation and some revised form of regulation adopted, this much will still hold true—our present experience in government operation cost us over two hundred million dollars for the first twelve months, and the deficit is still rising. Remembering that government operation was undertaken entirely as a war measure, the cost involved is negligible compared with other war expenditures, but if we can gain something from the present experience that will prove helpful to us in the future, it is up to us to do so.

The present grouping of roads into regions affords the regional directors the necessary means of making extensive studies pertaining to train operation and other problems which we have not so far succeeded in determining to our satisfaction. Now is the time when such studies can be carried on at a reduced expense, for the results may be applied to several roads instead of one. Under present conditions, when the regional director's office acts as a clearing house for several roads, there is more data available for such studies and competition is not keen enough to make unfavorable results too costly.

To carry on such studies it would be necessary to establish in each region an analytical organization whose duties should be confined to the weighing and scaling of operating performances on each road, suggesting improvements, determining results of accepted and rejected suggestions, keeping in touch with improvements on other regions and determining the effects of their application to the region in question or its individual roads, and to establishing such daily tabs of operation as will enable them to detect irregularities, changes or bad practises within a day or two instead of several weeks after they take place.

While few railroad men will fail to realize the necessity for such studies, some may ask the question, Why not make the present operating organizations do this work? Some may even go further and ask whether it does not mean that the operating officers are not credited with enough ability to entrust such work to them. This is not the case. Only ignorance of the conditions with which our railroad managements have had to deal of late would cause any one to criticize or doubt their ability. Our operating officers, however, are overloaded with work and responsibilities and have not the necessary time to devote to this complicated study. We have left the point where our inefficiencies were so apparent that a practical man could detect them with the naked eye. It now requires scientific tools merely to locate those leaks, much less to attempt to devise remedies and to see that they are carried out. Besides it would prove quite advantageous to have an organization that is not responsible for actual operation, for such an organization would be inclined to be somewhat theoretical and would pull upward where the practical operating officer would tend to pull downward somewhat, allowing himself enough safety. The resultant of the two forces would be the happy medium. When we realize that railroad operating expenses alone reach the $400,000,000 mark per month, if we make merely a one per cent improvement, think what this would mean as an investment.

Do our present methods of operation indicate the lack of analytical study? If they do, in what departments? To answer these two questions it will be necessary to make a survey of the workings of our roads in a general way and without hesitation to attempt to interpret the hows and whys, bearing in mind that in almost all cases our railway officers have done the best they could under the circumstances.

How many roads have purchased large locomotives before they were ready for them? These locomotives in many cases could not be used advantageously because of such minor obstacles as inadequate water and coaling stations. The principal obstacle encountered, however, in making full use of the new locomotives was inadequate sidetracks, tracks too short to take care of the new trains. Was there any economy there? Not much. How, then, did it come about? One way of accounting for it is through the fact that the officers who were directly responsible for the buying of those locomotives could not give the question as much study as the men who did the selling.

The fact that about 80 per cent of our yards and terminals have not kept pace with our facilities between terminals pleads very strongly for an analytical organization. Such an organization would have emphasized the fact that our freight is traveling only about 2 to 2½ hours out of every 24 hours, therefore more attention should be given to supervising and improving that part of our system which has most to do with the handling of our business. In making up the plans and estimates for construction work, our engineers have been handicapped by an insufficient knowledge of yard operation. There seems to have been a tendency not to recognize a train until there was a locomotive on one end and a caboose on the other. The real truth of the matter is that when a train reaches that stage most of the difficult work has already been accomplished and there is comparatively easy sailing until the caboose is again taken off or placed ahead of the locomotive. The wind has now started blowing the other way—everywhere one hears about increasing terminal facilities.

Of course, some improvement will be made thereby, but the time is not very far off when it will be recognized that added tracks and buildings alone will not solve the question of congested terminals. It is more of a psychological problem than a physical one, and it cannot be solved until this fact is recognized fully by our officers.

We have reached the time when a new unit has to be added to the consideration of economic railroad operation, i. e., the Unit of Labor. The introduction of a new unit is quite a complicated undertaking, especially in this case, where there are so many artificial barriers. It, therefore, requires constant and careful study by an organization especially fitted for such purposes.

The most successful road will be the one, which—other conditions being equal—will be able to haul more tonnage per unit of labor. In our future estimates of the benefits to be derived from grade reduction and the elimination of curvature more consideration should be given to the importance of being able to operate the road with less specialized labor per ton mile.

While an analytical organization is helpful for special problems, such as those indicated above, it is absolutely necessary for economic, efficient and satisfactory everyday operation. The railroads in the United States have been operating for the last couple of years with limited equipment. At the same time our records show that from 20 to repairs; that the remaining 75 to 80 per cent were actually on the road between terminals only from 30 to 40 per cent fact that our officers had all they could do to handle the current business, and there was no chance of retracing yesterday's work and looking for flaws. Something had to be very much out of line before it was changed. Our supervising facilities have not kept pace with our general progress. The result is that, whenever for some reason it becomes necessary to determine actual conditions in some shop or roundhouse, the management invariably sends special check-

ers for that purpose. Why not refer to the daily report?

To get the best out of our present facilities and to help make improvements in the most economic order we must watch closely our daily performance. Our record-breaking progress necessitated the breaking up of each railroad organization into several departments, each under the supervision of specialists in their respective lines. While the specialization was necessary to increase production, it has resulted in the sad experience that a man expert in his department knows little of the workings of the other departments. The latter means many cross-purpose practices. To offset this condition we are compelled to create an organization whose business should be the constant analysis of the workings of all departments, the determination of the relationship between different orders of the different departments. Such an organization should prove to be the most effective tool for efficient operation to our operating officers. Such an organization under proper co-operation will prevent unpreparedness and will do away with our present apparent necessary evil—that of quantity and lessening quality.

Reasons for the Increase in Employees*

By Walker D. Hines
Director General of Railroads

VARIOUS PUBLIC COMMENTS have been made upon the fact that there were about 140,000 more railroad employees in January, 1919, than in December, 1917. There has been at times a disposition to assume that this fact indicates that under federal control there has been a laxity of supervision on the part of the railroad officials throughout the country as compared with the sort of supervision which would characterize those same officials under private control. It is wholly unjust to attribute to these railroad officials any such failure in their duty to the government because the facts show that this increase in employees was due to entirely different and perfectly justifiable causes. These causes were, first, the establishment of the eight-hour day and, second, the exceptional amount of maintenance work which was performed on roadway and structures in January, 1919.

In December, 1917, many employees worked on the basis of 10 hours per day or longer, but during federal control and before January, 1919, the eight-hour day was put into effect for railroad employees. The adoption of the eight-hour day therefore made it necessary either to work many classes of employees overtime (and frequently at punitive rates of overtime) or to obtain more employees to perform the same number of hours of labor. Overtime is undesirable and costly and hence the proper policy is to obtain enough employees to avoid working overtime except in emergencies. The principal cause, therefore, for the increase in the number of employees, has been the adoption of the eight-hour day. This radical change for the protection of railroad labor makes it necessary to consider the number of hours worked instead of the number of employees worked. While in January, 1919, the number of employees increased 8½ per cent over the number of employees in December, 1917, the hours worked by employees in January, 1919, increased only 1½ per cent over the hours worked by employees in December, 1917. Thus the increase in the number of employees simply illustrates the carrying out of the policy, which I believe is generally endorsed as proper, that employees ought not to be required normally to work more than eight hours per day. The small increase in the number of hours worked reduced the disparity between December, 1917, and January, 1919, to very small proportions. The result therefore is that the principal cause of the increase in the number of employees is not any greater laxity on the part of railroad officials under federal control than was exhibited by those same officials under private control, but the adoption of the eight-hour day.

This entire increase in the hours of work in January, 1919, as compared with December, 1917, can be accounted for by the increase in maintenance work on roadway and structures. January, 1919, was an unusually favorable month for such maintenance work because of the exceptionally good weather and the availability of adequate forces. In December, 1917, severe winter weather began at an unusually early date and labor for maintenance work was exceedingly scarce because of war conditions and especially because the railroad companies were not paying wages adequate to attract maintenance labor. The result was that in January, 1919, an exceptional amount of maintenance of roadway and structures was performed, the expenditure therefor being 245 per cent of the expenditure for the same purpose in December, 1917. That the entire increase in hours worked on the railroads in January, 1919, can be accounted for in the principal classes of employees in maintenance of way and structures (foremen, section foremen, masons and bricklayers, structural ironworkers and section men), is shown by the fact that the increase in hours worked by these classes of railroad employees in January, 1919, as compared with December, 1917, was in excess of the total increase in hours worked by all railroad employees, so there was actually a slight decrease in the hours worked by all other railroad employees. The increased hours worked in January, 1919, by these maintenance forces does not imply any laxity on the part of the railroad officials throughout the country as compared with the attitude of the same officials under private management, but merely shows that these officials were taking advantage of good weather and a good labor supply to do an unusual amount of maintenance work.

Both of these propositions are further illustrated by the month of February, 1919. In that month as compared with December, 1917, the number of hours of work paid for on the railroads diminished 4.3 per cent while the total number of employees had increased 8 per cent, this condition being due, as already explained, to the recognition of the important principle of the eight-hour day. On account of the extraordinarily favorable weather in February, 1919, the expenditures in that month for maintenance of way and structures were 251.6 per cent of such expenditures in December, 1917, and the hours paid for to the principal classes of maintenance employees increased ½ per cent while the hours worked by all other employees decreased 5½ per cent. This situation again shows that the railroad officials in February, 1919, were simply taking advantage of good weather and good labor supply to do a greatly increased amount of maintenance work.

*Extract from address before Philadelphia Chamber of Commerce, June 20, 1919.

Director General Hines gives convincing reasons why the President should have control of railway rates as well as costs, but they are superfluous. One Interstate Commerce Commissioner has argued recently that the rates are high enough, and that the railways are fortunate in being under the protective control that has brought them into a precarious financial condition. Another Interstate Commerce Commissioner has recently argued that rates should not be increased because it would inflate the general price level—as though the Interstate Commerce Commission were charged with the regulation of the price level. It is true that the Commissioners long had company in the idea that the solvency of the railways was not important, and that it was not particularly in the care of the Commission. But that idea is now dead and buried, outside of the Commission. That it should survive there is a good reason for intrusting the regulation of rates elsewhere.—*New York Times.*

General News Department

Representatives of the regional directors will meet at Washington on July 7 with a committee representing the train service brotherhoods to discuss interpretations of the recent wage orders issued by the director general of railroads.

A railroad men's federation is proposed by E. H. Morton, president of the Order of Railway Station Agents and representative of a number of railroad employees' organizations, not including the "big four" brotherhoods of train service employees, met in Washington this week to start an organization.

The Black Tom disaster of 1916 has again been the subject of suits in the court at Jersey City, N. J., and on Saturday last verdicts against the Lehigh Valley Railroad were handed down amounting to $330,881. Most of these suits were those entered by insurance companies. One was for the loss of a schooner and cargo, $100,874.

Governor Bamberger, of Utah, with a party of Utah business men recently made a ten-day trip into the Uinta Basin to examine feasible routes for a railroad into that locality. If the territory promises enough present and future business to maintain a new line, the organization of a company to finance the project with Utah capital will be started at once Three proposed routes were examined, one by the way of Heber, another by the way of Stockmore, and the third over the Soldier Summit pass.

For the Alaskan Railroad the appropriation for the next fiscal year, as fixed by the Senate in the Sundry Civil bill is $12,000,000. The Alaskan Engineering Commission estimates that the railroad will be completed in 1921 at a total cost of $50,436,971, or about $73,200 a mile. It is planned to employ between 5,000 and 6,000 men on the project this summer. In the same bill, the Senate, over-ruling its committee on appropriations, increased the appropriation for the valuation of railroads from $2,000,000 to $2,500,000, which is the sum approved by the House.

New York to Chicago in eight hours, 43 minutes is the latest record of the airplanes carrying mail. This is the time made on July 1, and regular service is promised. The distance is estimated at 750 miles. The airplane started at 5:15 a. m., and flew to Belfont, Pa., at 123 miles an hour; another airplane took the mail from there to Cleveland, at 100 miles an hour, and thence the bags were carried by the regular airplane to Chicago, arriving at 12:58 p. m. The second assistant postmaster general says that on letters to the Pacific Coast about 24 hours will be saved; and he expects to take 12,000 such letters each trip.

A freight train three miles long, is to be run from Washington to San Francisco—a train of motor wagons to be run by the War Department as an experiment in military transportation. According to announcement, these automobile trucks will start on July 7 and will be expected to make 15 miles an hour. The "train" will traverse the Lincoln Highway, and it is calculated that the journey can be made in two months. A full complement of officers and men will travel with the train, which will carry supply and repair units. The War Camp Community Service has been requested to look out for the men along the line. Elaborate ceremonies are being planned to mark the arrival in San Francisco.

Honorably discharged officers in considerable number, many of them experts or technicians, and many with years of experience, are registered at the main office of the War Department at Washington, D. C., for assistance in securing employment fitted to their capacities. All of the men registered have superintended men in the field under trying conditions, and practically all professions and trades are included among them. Arthur Woods, assistant to the secretary of war, says that only about 7 per cent of American army officers need this assistance, and of these, two-thirds of the number have usually found positions before the assistance of the War Department is available.

Samuel H. Barker, of Philadelphia, in a letter to the New York Evening Post, nominates Brigadier General W. W. Atterbury for president of the United States. Republicans in Congress, says Mr. Barker, have demonstrated themselves little men; the nation wants a man who can plan and accomplish big things in a direct, business way. General Atterbury, 53 years old, has never been in politics; has made his own way; has demonstrated that he is a man with broad vision, workable ideas and a mind given to attacking hard problems and getting practical solutions. He comes back from Europe with an open mind on the railroad and other economic problems which are now coming up for attention in new forms.

The Senate committee on banking and currency, which is considering the confirmation by the Senate of the re-nomination of John Skelton Williams to be comptroller of the currency, has listened to charges, presented by Wade H. Cooper, a Washington banker, that Mr. Williams, while Director of the Division of Finance of the Railroad Administration, had sanctioned or acquiesced in the payment of an excessive rental to the Georgia & Florida, Railroad, of which Mr. William's brother was one of the receivers. Mr. Cooper said that the road was guaranteed an annual rental of $88,000, although it had had a deficit during the period before federal control. Mr. Williams testified that he had never given his approval to the contract involved, had never even read it, was not present at the conference at which it was passed upon, and had never made any recommendations or suggestions in regard to it.

Heavy loading of freight cars, carried out with a good degree of efficiency during the war, is the subject of a bulletin, which has been issued by the Canadian Railway War Board, calling for the continuance of the efforts which produced such improvement last year and the year before. This bulletin, addressed mainly to shippers, says that the average loaded car in 1919 was 27 tons, as compared with only 20 tons in 1914. Taking the average train of loaded cars this increases the net hauling capacity of the locomotive by 15 per cent. The prompt unloading of freight also worked important savings and consignees are exhorted to continue that economy also. Those who have abandoned their efforts because the war is over are compared to the captain who, after passing through a storm at sea, orders the lifeboats pitched overboard, so as to increase his speed by lightening of the ship.

Safety Record in Northwestern Region

A safety record compiled for roads in the Northwestern region for the four months ending April 30, shows a decrease in casualties of 1,815 or 22.28 per cent, as compared with the records for the same period in 1918. There was a decrease in the number of employees killed of 53 or 36.81 per cent and in employees injured of 1,733 or 34.7 per cent. The record for all persons, including employees, shows that 113 or 33.4 per cent less persons were killed and 1,702 or 21.81 per cent less persons were injured during this period on lines in this region than were injured or killed during the same period last year. On the Fort Dodge, Des Moines & Southern the number of casualties decreased 92.5 per cent.

Deadheads' Names Called For

Senator Newberry has introduced in Congress a resolution calling on the director general for a statement as to the number of annual passes issued for the year 1919, good over all lines, under the Railroad Administration, including passes good for sleeping-car and parlor car accommodations or free dining-car service, the report to include the name and residence of the recipient and the date of mailing, by whose order and for what reason each pass was issued.

Saving Cement Sacks

The Northwestern Regional Purchasing Committee, in advocating the proper care of empty cement sacks and their prompt return to the manufacturers for credit, says that one road has installed a machine, at the cost of $125, for cleaning sacks; and reports that during the year 1918 an average of 8,500 sacks were cleaned weekly. Cement to the amount of 367 barrels was reclaimed, valued at $940. The same road also makes a practice of repairing cement sacks, and reports that during 1918, 19,475 sacks were repaired at a cost of $230, or a little over one cent each, and by making these repairs $375 was saved.

Winnipeg Strike

The general sympathetic strike which has been in progress at Winnipeg since May 15, ended on June 24, according to an announcement issued by the Central Strike Committee, which has been conducting the strike, ordering all men back to work on June 26, exactly six weeks from the time the strike was called. The terms of the ending of the strike are not clearly outlined in despatches from Winnipeg; however, the strike leaders have been unable to obtain any concessions, and the surrender appears to be unconditional. A government commission of investigation will be appointed to conduct an investigation into the strike and to settle all disputes between the employers and strikers.

Administration Equipment Trust Certificates

The committee of the Association of Railway Executives, the Bankers' committee and the Railroad Administration have agreed upon a plan providing for the issue of $280,000,000 six per cent, 15-year equipment trust certificates, the proceeds of which are to be used to pay in part for the $400,000,000 equipment which has been ordered during the period of government control.

An equipment corporation is to be formed with power to buy, sell and lease railroad equipment. This corporation will have $148,000,000 capital stock to which it is proposed that the Railroad Administration subscribe. Of this amount $120,000,000 is to be used to repay the Railroad Administration 30 per cent of the cost of the equipment, and $28,000,000 is to be used as a reserve fund. This company will issue the $280,000,000 equipment trust certificates to the general public and will sell the equipment, costing $400,000,000, to the railroad companies on the installment plan. The installments paid by the railroad companies will be sufficient to provide for the retirement serially of the equipment trust certificates and provide interest thereon and to liquidate the stock.

Progress of Valuation Work

In a statement made recently before the appropriations committee of the House of Representatives, Director C. A. Prouty said that the road and track parties in all districts will substantially complete their work this year, and that four parties have already been disbanded in the Pacific district and five in the Southern district. The land and the field accounting work will be completed in about two years, while the office work will be completed in about three years.

The complete engineering, accounting and land reports for the Boston & Maine system have been received, while the director stated that similar reports had been completed for the Rock Island. It is estimated that the division will receive completed reports from the engineering section on 50,000 miles of road during 1919, similar reports having been received on 25,000 miles of road up to January 1 of this year. The inventory of the Western Union properties has been practically completed, while the most important part of the inventory of the Postal Telegraph properties will be completed in about six months. Work is just about to begin on the properties of the American Telephone & Telegraph Company. Up to December 31, 1918, $13,706,197 had been expended by the federal valuation department, of which $13,206,831 had been expended on the valuation of the railroads. The commission has authorized the appointment of about 1,525 men, and the average force of the division of valuation during 1918 was about 1,325 men.

Rear Collision at Dunkirk, N. Y.

In a rear collision of passenger trains on the New York Central at Dunkirk, N. Y., on the morning of July 1 at 2:20, eight passengers, the baggageman, the engineman and the fireman of train No. 7, and one trespasser were killed, and 17 passengers were injured. A number of others sustained minor injuries. Westbound passenger train No. 41, standing at the station, was run into at the rear by westbound passenger No. 7, wrecking the rear sleeping car. No. 7 struck at 40 or 50 miles an hour. The baggage car of No. 7, a wooden car, was crushed, and the coach next behind it, a steel car, was turned crosswise of the track and its side torn open; and in this car and the rear sleeper of No. 41 the passenger fatalities occurred. The trespasser was riding between the tender and the leading baggage car.

Train 41 had been standing at the station about 47 minutes because of a hot journal. It was properly protected by a home block signal 2,000 ft. back and a distant signal 4,125 ft. farther back; and the flagman was back 1,700 ft. with a red light. There is, however, no question about protection, as the engineman of No. 7, F. L. Clifford, had sounded the whistle for hand brakes, indicating that the air brakes did not properly act. Clifford was alive when taken from his engine and said that the brakes did not hold. This seems to be confirmed by the examination of the wreck, which disclosed that the air-brake angle cock at the rear of the tender was shut; and it is believed that the man riding there had closed it, intentionally or otherwise. This trespasser was identified as Charles Schiller. He was a resident of Dunkirk, which tends to confirm the supposition that, finding that the train was likely to pass through the town without stopping, he decided to himself apply the brakes and mistakenly assumed that he could do this by turning the angle cock.

Western Society of Engineers' 50th Anniversary

The Western Society of Engineers, Chicago, celebrated the fiftieth anniversary of its organization on June 27 and 28. This society was founded in May, 1869, as the Civil Engineers' Club of the Northwest, the name being changed to the Western Society of Engineers in 1880.

The program was opened at 3 o'clock on Friday afternoon with an outline of the history of the society and of the most important achievements, presented by E. S. Nethercut, secretary. This was followed by brief reviews of the developments in engineering progress during the last 50 years in (1) transportation, by Samuel O. Dunn, editor of the *Railway Age;* (2) steam power, by J. R. Bibbins, of the Arnold Company, Chicago; (3) electric light and power, by J. R. Cravath, consulting electrical engineer, Chicago; (4) electrical communication, by F. F. Fowle, consulting telephone engineer, Chicago, and (5) sanitary engineering, by J. W. Alvord, consulting engineer, Chicago.

The evening was devoted to reminiscences of the early days of the society by past presidents, twelve of the 23 living past presidents being present. In all, 39 presidents have served the society. The speakers included Samuel G. Artingstall, Isham Randolph, consulting engineer, John F. Wallace, president, Westinghouse, Church, Kerr & Company, New York; Ralph Modjeski, consulting bridge engineer; W. L. Abbott, chief operating engineer, Commonwealth Edison Company; Charles F. Loweth, chief engineer, C., M. & St. P.; Andrews Allen, consulting engineer; John W. Alvord, consulting en-

gineer; Albert Reichmann, division engineer, American Bridge Company; H. J. Burt, manager, Holabird & Roche, architects, and Charles E. Burdick, consulting sanitary engineer.

Traveling Engineers' Association

The annual meeting of the Traveling Engineers' Association, to be held at Hotel Sherman in Chicago in September, will begin on the 16th instead of the 9th; and will hold through Tuesday, Wednesday, Thursday and Friday, ending on the 19th.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

AIR BRAKE ASSOCIATION.—F. M. Nellis, 165 Broadway, New York City. Next convention, May 5-7, 1920, Chicago.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, Supervisor of Demurrage and Storage, C. & N. W. Ry., Chicago.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—E. H. Thayer, St. Louis-San Francisco R. R., St. Louis, Mo.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, Chicago.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—J. E. Quick, Port Huron, Mich.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Union Station, St. Louis, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York. Next convention, October 6-10, Atlantic City, N. J.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—C. F. J. Dell, 50 E. 42nd St., New York.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPE FITTERS' ASSOCIATION.—Otto E. Schlinck, 485 W. 5th St., Peru, Ind.

AMERICAN RAILROAD ASSOCIATION.—J. E. Fairbanks, 75 Church St., New York:

Section I, Operating (including former activities of Association of Railway Telegraph Superintendents' and Railway Storekeepers' Association)..

Section II, Engineering (including former activities of American Railway Engineering Association and Railway Signal Association).—E. H. Fritch, 431 South Dearborn St., Chicago.

Signal Division.—H. S. Balliet, 75 Church St., New York.

Section III, Mechanical (including former activities of Master Car Builders and Master Mechanics Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago.

Section IV, Traffic (including former activities of Freight Claim Association).

Section V, Transportation (including former activities of Association of Transportation and Car Accounting Officers).

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Austin Station, Chicago. Next convention, October 21-23, 1919, Cleveland, O.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—(See American Railroad Association, Section II, Engineering).

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—(See American Railroad Association, Section III, Mechanical.

AMERICAN RAILWAY PERISHABLE FREIGHT ASSOCIATION.—E. F. McPike, 135 E. 11th Place, Chicago. Regular meetings, 2d Wednesday in March and September.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—R. D. Fletcher, 6202 Greenwood Ave., Chicago. Next convention, August 27-29, Hotel Sherman, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—C. L. Warwick, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Charles W. Hunt, Engineering Societies Building, 33 W. 39th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 33 W. 39th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—T. F. Whittelsey, 708 Union Trust Bldg., Washington, D. C.

AMERICAN TRAIN DESPATCHERS' ASSOCIATION.—D. L. Darling, Northern Pacific Ry., Spokane, Wash.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Mt. Royal Sta., Baltimore, Md.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, C. R. R. of N. J., Jersey City, N. J.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Next meeting, October, 1919, Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—(See American Railway Association, Section I, Operating).

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—(See American Railroad Association, Section V, Transportation).

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—M. J. Trees, Chicago Bridge & Iron Company, Chicago. Next annual convention, October 21-23, 1919, Cleveland, O.

CANADIAN RAILWAY CLUBS.—James Powell, 46 Aberdeen Ave., St. Lambert (near Montreal), Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawler Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, New Morrison Hotel, Chicago.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meetings, 2d Thursday in November, and 2d Friday in January, March, May and September, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, New York.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—D. B. Wright, Lehon Company, 45th and Oakley Sts., Chicago.

EASTERN RAILROAD ASSOCIATION.—D. G. Stuart, Washington, D. C..

FREIGHT CLAIM ASSOCIATION (See American Railroad Association, Section IV, Traffic.)

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Sta., Chicago. Regular meetings, Wednesday preceding 3d Friday in month, Room 856, Insurance Exchange Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, B. & O., Lima, Ohio. Next convention, August 19-21, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, 702 E. 51st St. Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn. Next convention, October 21-23, 1919, American Annex Hotel, St. Louis, Mo.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION.—F. W. Hager, 1323 Hurley Ave., Ft. Worth, Tex. Next annual convention, October 21-23, 1919, American Annex Hotel, St. Louis, Mo.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next meeting, September, 1919, Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—(See American Railroad Association, Section III, Mechanical).

NATIONAL ASSOCIATION OF RAILWAY AND UTILITIES' COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York. Next annual convention, October 14, 1919, Indianapolis, Ind.

NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, Kelly-Derby Co., Peoples Gas Bldg., Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, excepting months of June, July, August and September.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—George A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Regular meetings, 3d Tuesday in each month, Tenjost Hall, Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Bldg., Washington, D. C. Next annual meeting, June 11, 1919, Hotel Commodore, New York.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, December, 1919, Buffalo, N. Y.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in month except June, July and August, Colonial Annex Hotel, Pittsburgh, Pa.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Missouri Pacific R. R., St. Louis, Mo.

RAILWAY ELECTRIC SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, General Electric Co., Chicago. Annual meeting with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—D. L. Eubank, Galena Signal Oil Company, Richmond, Va. Next annual meeting, September, 1919, Hotel Sherman, Chicago.

RAILWAY FIRE PROTECTION ASSOCIATION.—G. L. Ball, St. Louis-San Francisco Ry., St. Louis, Mo. Next annual meeting, October 21-23, 1919, La Salle Hotel, Chicago.

RAILWAY REAL ESTATE ASSOCIATION.—James P. Nelson, President, C. & O., Richmond, Va.

RAILWAY SIGNAL ASSOCIATION.—(See American Railroad Association, Engineering Section, Signal Division).

RAILWAY STOREKEEPERS' ASSOCIATION.—(See American Railroad Association, Section I, Operating).

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Co., 30 Church St., New York.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W. Ry., Sterling, Ill. Next annual convention, September 16-18, 1919, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, West Nyack, Rockland County, New York.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3d Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, Western Ry., of Ala., Atlanta, Ga.

SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—C. N. Thulin, Duff Manufacturing Company, 935 Peoples Gas Bldg., Chicago. Next convention, August 27-29, Hotel Sherman, Chicago.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Next annual convention, September 16-18, 1919, Auditorium Hotel, Chicago.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, O. Next annual meeting, September 16-19, 1919, Hotel Sherman, Chicago.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco.

WESTERN RAILWAY CLUB.—J. M. Byrne, Chief Clerk to Mechanical Assistant, Central Western Region, 547 Jackson Blvd., Chicago. Regular meetings, 3d Monday in month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except July and August.

Traffic News

All embargoes in connection with freight shipments on the Canadian Pacific Western lines has been removed as a result of the collapse of the Winnipeg general strike.

O. E. Duggan, assistant traffic manager of the Lutcher and Moore Lumber Company, Orange, Tex., has been appointed traffic manager for the Judson Freight Forwarding Company, at New Orleans, La.

The Missouri Pacific has resumed through freight train service to and from New Orleans and all other points on the Trans-Mississippi Terminal Railroad, and will re-establish a division freight office at New Orleans.

The strike of freight handlers at New York City, was settled on June 26 and perishable freight was moving in normal volume within one or two days thereafter. It is said that the damages by the strike were mitigated by diversion of many shipments of fruit and vegetables to other cities.

The first of the new steel barges under construction for the United States Railroad Administration, for service on the Mississippi river between St. Louis and New Orleans was launched by the American Bridge Company at Pittsburgh on June 26. This is one of 40 similar barges under contract for lower Mississippi river service. One barge is to be launched every two weeks.

The revenue freight loading on roads in the Northwestern region for the week ending June 24 show a decided decrease, when compared with the corresponding period last year. The total number of cars loaded in 1918 was 182,047, whereas in 1919 the total was 156,408. The number of grain and grain products cars loaded show an increase from 7,747 to 10,161, whereas the reports compiled for other classes of freight loading show substantial decreases.

A movement to secure a reduction of 20 per cent in railroad fares by commercial travelers and other large users of mileage tickets was started recently at the thirty-second annual convention of the supreme council of the Order of United Commercial Travelers of America at Columbus, Ohio. Supporters of the movement cited the difference between the special rates for railroad travel in Canada and rates for commercial traveling men in the United States.

Delegates to the thirtieth annual convention of the Travelers' Protective Association, have begun a campaign to have train schedules printed as advertising in newspapers in a similar form to that generally in effect before the outbreak of the war. The Railroad Administration has said that it was problematic as to whether such advertisements did the public any good and that the expense was too great. The Dameron-Pierson Company, a stationery and office appliance firm at New Orleans, has advertised train schedules in the New Orleans papers as a matter of convenience to the public.

The Wescott Express (baggage transfer) Company, New York City, has been doing little or no business for the past week because of a walkout of one hundred wagonmen, although it was said that the assistance of other express companies and taxicabs had prevented congestion of baggage. The general manager of the company said the demands of the men for shorter hours, more wages, and no Sunday work amounted practically to more than 100 per cent increase, and that the company had no intention of granting the demands. Passengers and railroad station baggage men have suffered much inconvenience.

The American Railway Express Company is planning to extend throughout the country the plan for waybilling freight that it has had in operation in the east since 1914. The new plan will be inaugurated about September 1. It is a combination of the coupon waybill and single entry delivery methods and will save labor. It will also have the effect of standardizing practice, as against four or five different waybilling methods of the old express companies which are still being used. Preparations are being made to instruct employees in the operation of the new plan and about 400 men will be detached from their regular work for two months for this purpose.

The Traffic Club of Chicago at a special meeting held on June 24, adopted resolutions endorsing the principles of the Esch-Pomerene bill. It recommends that the words "and the cost of capital" be added after the words "operating costs" in line 15, page 23, of that bill; that legislation be enacted placing under the Interstate Commerce Commission the arbitration and settlement of disputes between railroad managements and their employees over wages and conditions of service, and that the Poindexter long-and-short haul bill be killed. The resolutions are to be sent to Congress and also to other traffic clubs throughout the country with the suggestion that similar action be taken by the latter.

According to a report on overseas traffic for the week ending June 25, on June 25 there were 9,867,640 bushels of grain in the elevators at North Atlantic ports. While there had been received in the elevators 5,701,194 bushels, there had been cleared during the week 5,582,421 bushels, an excess of receipts over deliveries of 118,773 bushels. As to South Atlantic and Gulf ports as of June 21, there were 4,558,603 bushels of grain in elevators divided between New Orleans and Galveston, Port Arthur and Texas City being empty. The total number of carloads of export freight on hand at North Atlantic ports, on June 25, exclusive of bulk grain and coal, was 23,526 cars, as compared with 24,604 cars for the same day of the preceding week. At these same ports there were 6,488 carloads of export food on hand on June 25, as against 6,948 carloads on June 18. Tonnage for the French and British governments, the Food Administration and the Wheat Export Company at the port of New York is ample to supply all demands. At South Atlantic and Gulf ports as of June 21, there were 10,226 car loads of export freight on hand as against 10,894 cars on June 14.

Boatmen on the New York State barge canal, and their friends, declare that the Railroad Administration must take its hands off the canals of the state and "give to those who have their money invested in the floating property that traverses thereon an opportunity to get some business." There is a fixed annual charge imposed upon the citizens of New York State of something like $7,000,000, the annual interest payable on the $155,000,000 canal and terminal bond issue, plus the cost of maintenance. When the Railroad Administration accepted the use of the canals from the State authorities, no provision was made to see that the investors in these state waterways were assured of any returns upon their investment. "These canals," say the boatmen, "should be utilized to their maximum, and to date it is necessary to encourage capital to invest in the flotilla necessary to carry the freight. It is hard enough to get investors in floating property of this kind under ordinary conditions; but it is an absolute impossibility to do so if we are going to continue to compete against Government operators. They can carry freight at a loss. Who cares? Uncle Sam is rich, and he foots the bill."

Charles F. Guggenbuehler, of Newark, N. J., inventor of a lining for bearing boxes on locomotives, which he alleges will save the railroads $25,000,000 a year, has petitioned the Supreme Court in New York City for an injunction restraining the disposition of stock in a corporation formed to exploit the patent. He claims that after the invention had been tried out by Government inspectors in the yards in Jersey City, and they had expressed their satisfaction, C. V. Lutz induced him to assign his patent to Lutz to enable the latter to present it to the Government because it would not be accepted from Guggenbuehler, he being an enemy alien. The plaintiff says Lutz has given him only 25 per cent of the stock.

Equipment and Supplies

Locomotive Deliveries

The following locomotives were shipped to railroads under federal control during the week ended June 21:

Works	Road	Number	Type
American	B. & O.	7	USRA 6W.SW.
	A. T. & S. F.	3	Pacific
	*A. T. & S. F.	1	Mount.
	B. & O.	4	USRA Pac.
	C. B. & Q.	1	Santa Fe
	Erie	2	USRA Pac.
	**N. & W.	1	Mallet
	M. K. & T.	8	USRA 8W.SW.
	Penn.	1	Mallet
	S. P.	2	Santa Fe
	U. P.	1	Santa Fe
		24	
	Total	31	

*This locomotive shipped 6/11/19. Information not received in time to include in report of week ended June 14, 1919.

**This locomotive reported shipped by the builder for week ended June 14, in error.

Locomotives

THE BOSTON & MAINE is asking for prices on 20 locomotives.

THE TEXAS & PACIFIC is inquiring for 25 locomotives of the Santa Fe type.

THE HAVANA CENTRAL is inquiring for 6 six-wheel sinteling locomotives and one narrow gage Consolidation.

Freight Cars

THE SEMET-SOLVAY COMPANY, Harriett, N. Y., is inquiring for three coal cars.

THE FRENCH STATE RAILWAYS are asking prices in this country for 1,000 freight cars.

THE INTERNATIONAL SHIPBUILDING COMPANY, Pascagoula, Miss., is inquiring for storage battery cars.

THE AMERICAN OCEANIC CORPORATION, New York, is in the market for 5,000 flat cars for export to France.

THE HAVANA CENTRAL is inquiring for 500 30-ton boxcars, 500 25-ton flat cars and 50 15-ton narrow gage cane cars.

THE BUSINESS RESEARCH & DEVELOPMENT COMPANY, Chicago, is inquiring for several 5,000 to 8,000-gal. tank cars.

M. A. HANNA & COMPANY, Wilkesbarre, Pa., have ordered 25 mine cars from the American Car & Foundry Company, Chicago.

THE SHELL COMPANY, San Francisco, Cal., has ordered two 50-ton 10,000 gal. three compartment tank cars from the American Car & Foundry Company, Chicago.

THE CUBAN RAILROAD COMPANY, New York, has ordered from the American Car & Foundry Company, Chicago, 150 40-ton box cars and 25 first and second class passenger, baggage and mail and express cars.

Signaling

AN INTERLOCKING MACHINE, 40 levers, all-electric, was furnished by the General Railway Signal Company, Rochester, N. Y., for the Lehigh Valley, last month, in two weeks from the time the order was received. This machine was for the junction at South Plainfield, N. J., where the tower was destroyed by fire. The order for the new machine was immediately given by telephone, and the first shipment of material was made within one week.

Supply Trade News

George W. Jones, assistant manager of the New York office of the **Pittsburgh Steel Company,** of Pittsburgh, Pa., has been appointed manager of the Chicago office, with headquarters in the McCormick building.

John McConnell, who has charge of alloy steel production for the **Interstate Iron & Steel Company,** Chicago, as assistant to the vice-president with headquarters at Canton, Ohio, has been promoted to vice-president with headquarters at Chicago.

The Sims Improved Rail Anchor Company, Ltd., Toronto, Ont., has been incorporated to manufacture railroad machinery and other devices. The company is capitalized at $100,000 by Mervil MacDonald and Edwin Smily, of Toronto, and others.

Lieut.-Col. Elmer K. Hiles, Engineers, A. E. F., who went over as captain in the Fifteenth Engineers, and who has just returned after nearly two years' service in France, will join the **Pittsburgh Testing Laboratory** on July 15, as manager of laboratories, with headquarters at Pittsburgh.

W. M. Carty, assistant superintendent of the American Brake Shoe & Foundry Company, Chicago, has been appointed superintendent of the Pine Bluff, Ark., plant of the **Standard Brake Shoe & Foundry Company.** The latter company recently purchased equipment to increase its capacity from 350 to 800 tons a month.

J. H. Redhead has been appointed assistant to the vice-president in charge of miscellaneous sales of the **National Malleable Castings Company,** Cleveland, Ohio. **C. C. Gibbs,** until recently associated with the sales department of the Indianapolis plant, has been appointed sales agent of the Cleveland plant, succeeding Mr. Redhead.

E. E. Maher has organized the **Maher Engineering Company,** with office in the Michigan Boulevard building, Chicago, to handle the sales and installation of Erie Engine Works high speed engines, Sims feed water heaters, Dayton-Dowd centrifugal pumps, Wagener steam pumps and Pratt Engineering & Machine Company fertilizer and sulphuric acid machinery.

W. H. Woody, until April 17, 1919, supervisor of the shipfitters and allied trades at the government navy yard, Portsmouth, Va., and before enlistment in government work affiliated with the Chicago Pneumatic Tool Company, Chicago, as special representative, has been placed in charge of the Washington, D. C., office of the **Keller Pneumatic Tool Company,** Chicago.

Major Morrill Dunn, vice-president of **McCord & Co.,** Chicago, has received the decoration of Chevalier of the Legion of Honor from the French government in recognition of his services during the war. Major Dunn was commissioned a captain in the Signal Corps of the United States Army and assigned to overseas duty in October, 1917, where he continued in service until his recent discharge.

J. G. Carruthers, manager of sales of the **Carnegie Steel Company,** the **Illinois Steel Company,** and the **Tennessee Coal, Iron & Railroad Company,** with headquarters at Cincinnati, Ohio, has been appointed manager of sales for the Chicago district of the Illinois Steel Company at Chicago. He has been succeeded at Cincinnati by **George H. Vant,** who has been transferred from the Pittsburgh office of the Carnegie Steel Company.

Wonham, Bates & Goode, Inc., engineers, manufacturers' representatives and exporters, New York, have opened a branch office in the Dominion Express building, Montreal, Que., in charge of **A. G. Nutter,** who was formerly with

Mussens, Ltd. This extension is for the purpose of facilitating business between the United States and Canada, particularly in railway supplies, industrial equipment and iron and steel products.

The Ohio Electric & Controller Company, Cleveland, Ohio, announces that it has appointed as its representatives the following firms: The Iron & Steel Equipment Company, Pittsburgh, Pa.; Williams, Beasley Company, Chicago; Linn O. Morrow, Philadelphia, Pa.; J. W. Dopp Company, Detroit, Mich.; Kelly, Powell, Ltd., Winnipeg, Canada; Wonham, Bates & Goode, Inc., Montreal, Canada; Shook & Fletcher Supply Company, Birmingham, Ala.; Wonham, Bates & Goode, Inc., New York City—London, Paris, Havana and Rio De Janeiro; Mitsui & Company, New York—Japan, China, Philippine Islands and Honolulu; Gustav Neilson A/S Christiania, Norway, Sweden and Denmark.

The Metallo Gasket Company has recently been incorporated to manufacture gaskets and other packings, at New Brunswick, N. J., with the following officers: **Zeno Schultes,** president and treasurer; **George Geipel,** vice-president, and **Stanley S. Geipel,** secretary. Mr. Schultes was manager of the Goetze Gasket & Packing Company for about 14 years. George Geipel has been an erecting engineer for 35 years, specializing in refrigerating and steam power plants, and Stanley S. Geipel has had ten years' experience in mechanical engineering. The company will concentrate for a time on its metallo corrugated copper gasket with asbestos cord inlaid in the copper grooves or corrugations.

Railway Construction

CHICAGO & NORTH WESTERN.—This company contemplates the construction of an addition of 78 storage bins to its grain elevator at South Chicago, which will cost approximately $1,000,000, and will increase the capacity of the elevator by 3,000,000 bu. Contracts for the work have not been let.

PHILADELPHIA & READING.—A contract has been given to Charles C. Pace for building a new power house for the engine house, which was recently built in the yard at Reading, Pa. The new building will be a brick structure on concrete foundation, 38 ft. wide and 50 ft. long.

Walker D. Hines, Director General of Railroads, has fought a good fight not merely for the roads operating at desperate losses, but also for the shippers and for the American people, who in the last analysis must foot all the bills. He has never sought to disguise the truth that heavier costs put the brakes on business in general. With the sound sense of the practical railroad man he has wanted reasonably high rates that would permit the carriers to pay their own way with full train loads. He has been wise enough to see that it was economic lunacy to try to force the railroads, bleeding to death, to pay steel and coal prices fixed at inordinately high levels so as to keep the steel industry and the coal industry thriving on an artifical basis. He has been catholic enough to conceive and daring enough to contend that in such a predicament as they are caught—the "vicious circle"—the American people would be better off to stand more taxes to meet the railway deficits than more and heavier rate increases to avoid the deficits. Nevertheless, he feels that the stupendous operating deficit, threatening the very Treasury, may compel the Railroad Administration to fall back on the old, old transportation principle, so notorious in the wicked private management days, of "taxing the traffic what it will bear." In spite of inflated prices there is traffic which flows as abundantly at present high rates as it flowed before at low freight rates. Because of inflated prices there is traffic which will not flow freely at the present freight rates. There is traffic which will scarcely flow at all. So let the traffic that will pay anyhow pay still more. * * * This, then, would be a return to scientific rate making; something we have had too little of, ever since the Interstate Commerce Commission began to work the ruin of the American railway system. * * *—*New York Sun.*

Railway Officers

Railroad Administration

Central Administration

James W. Carmalt has resigned as assistant to the general counsel of the Railroad Administration to engage in the practice of law at Washington, D. C. He was formerly chief examiner of the Interstate Commerce Commission.

L. Yager, engineer maintenance of way of the Northern Pacific, has been appointed chief maintenance of way engineer in the Division of Operation, with office at Washington. Mr. Yager entered railway service in 1899 as chainman on the Minneapolis & St. Louis. In 1900 he entered the service of the Northern Pacific as rodman, and has been with the same road since that time. He later served as inspector, assistant engineer, superintendent of bridges and buildings, division engineer and acting engineer maintenance of way On April 1, 1917, he was appointed engineer maintenance of way.

Regional

L. M. Betts, supervisor of car service, Northwestern region, has been appointed supervisor of transportation, Northwestern region, succeeding **D. B. McIntyre,** who has resigned to become assistant traffic manager of the Simmons Company, Kenosha, Wis.

Federal and General Managers

A. E. Sweet, formerly vice-president of the Denver & Rio Grande, with headquarters at Denver, Colo., has been appointed federal manager of the El Paso & Southwestern and the El Paso Union Passenger Depot, with headquarters at El Paso, Texas, to succeed **G. F. Hawks,** who has resigned.

Engineering and Rolling Stock

J. H. Minton, senior assistant engineer on the Pennsylvania Western Lines, with headquarters at Pittsburgh, Pa., has resigned to accept a position with the United States Steel Corporation at Pittsburgh. The field work formerly handled by Mr. Minton has been placed in charge of **T. M. Bole,** assistant engineer with headquarters at Pittsburgh and the office details and preparation of plans and specifications in connection with new construction work, formerly handled by Mr. Minton has been taken over by L. P. Struble, assistant engineer with headquarters at Pittsburgh.

Purchasing

T. S. Edgell, traveling storekeeper of the Mobile & Ohio, with office at Mobile, Ala., has been appointed division storekeeper, with headquarters at Murphysboro, Ill., vice **E. H. Landers,** resigned to accept service with another company.

The jurisdiction of **W. C. Bower,** purchasing agent of the New York Central, with headquarters at New York, has been extended over the Line West of Buffalo, vice **G. R. Ingersoll,** who has resigned to engage in other business; **C. C. Warne,** assistant purchasing agent, has been appointed first assistant purchasing agent, with office at New York, and **W. P. Winter** has been appointed assistant purchasing agent, with office at Cleveland.

Obituary

Henry E. Graves, who retired from active railway service as commercial agent of the Grand Trunk several years ago, after 26 years of service with that road, died at his home in River Forest, Ill., on June 25.

EDITORIAL

Railway Age

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Closing—Not Opening—a Cycle

One argument which has been made against another advance in railway rates is that it would open a new cycle of increases in the cost of living. The advances in the wages of railway employees which have been made under government operation are officially estimated to average 52 per cent, and the average increase in the prices of railway materials and supplies since 1917 is estimated at 35 to 40 per cent. The increase in the cost of living between the end of 1915 and the end of 1917 was about 45 per cent, and there has been a still further increase since then. Prior to 1917 there was practically no advance in railway rates, the average receipts per ton per mile in 1916 being the lowest ever recorded. In 1917 and 1918 there was an increase of approximately 40 per cent in freight rates in eastern territory and of about 25 per cent in the rest of the country and an increase in passenger rates of about 50 per cent throughout the country. Passenger earnings are only one-fifth of the total earnings of the railways, while freight earnings are three-fourths. Therefore, while the railroads have had an increase of 50 per cent in the rates from which they derive one-fifth of their revenues, they have had an increase averaging only about 30 per cent in the rates from which they derive three-fourths of their revenues. In other words, during the cycle of greatly increasing wages, prices and cost of living since 1915, railway rates have been advanced relatively only about one-half as much as wages and prices generally and the cost of living. To say that an advance in rates sufficient to make the total increase in rates as great in proportion as has been the increase in prices and in the cost of labor generally since 1915 would open a new cycle is to ignore the facts. Such an advance in rates would merely close an old cycle, not begin a new one. The railways are really suffering in two ways, first, because they were not given the advances in rates which they needed before the end of 1915, and, second, because the advances in rates made since then have not beeen relatively as large as the increases in the wages and prices they have to pay and in wages and prices in general. Let us close the old cycle by establishing a reasonable relationship between railway rates, and wages and prices, before we begin to talk of the danger that an advance in railway rates will open a new cycle of increases in wages and prices and the cost of living.

Improved Main Driving Boxes Needed

If one were to speculate on the ultimate limit of power which may be developed in a single unit locomotive, probably the first factors to be considered would be clearance limitations, wheel loads and the possible length of rigid wheel base, all of which are no doubt capable of some increase beyond the limits so far actually reached in most of the locomotives of the Santa Fe type now in service. There is one detail of running gear, however, which seems likely to become a more serious limitation than any of these; that is, the main driving box. Increases in the size and power of locomotives have been accompanied by constantly growing difficulties in the proper maintenance of the main boxes and side rods, due largely to the inability of the box to properly withstand the longitudinal thrusts produced by the increased total piston loads. The demands for greater power have been met only partially by increased wheel loads; the changes in the axle load limits have been kept within a comparatively narrow range, while the number of axles has been increased. The longitudinal loads produced by the piston thrust have therefore increased in much greater proportion than the journal loads due to weight. As the piston thrust must be withstood initially by the main driving boxes, a situation has already been created where the present types of boxes are inadequate satisfactorily to meet the conditions imposed. If further increases are to be made in cylinder loads it seems evident that provision must be made to withstand the increased longitudinal forces by a driving box design considerably different from any of those now in common use. Otherwise we must look to the Mallet type for future developments.

Is Railroad Work Losing Its Attraction

Colonel James A. McCrea, until the outbreak of the war general manager of the Long Island, has resigned from railroad service to become vice-president of the bankers' Trust Company of New York. It is not that a vice-presidency of the Bankers' Trust Company would not be a worthy goal for an ambitious man of 44, but that a railroad career, such as Mr. McCrea had open to him, should be abandoned for any other work, which makes this announcement peculiarly significant. James A. McCrea is the son of the late James McCrea, who was president of the Pennsylvania from 1907 to 1913. The son had been brought up in the traditions of the Pennsylvania which, in some ways, is the most attractive railroad service in the world, and he had made good. He had risen, step by step, from the position of rodman on the Pennsylvania Lines West to superintendent of the Cincinnati division of the lines west, and was then made general superintendent of the Long Island. In 1911 he was made general manager of that line. He grasped the opportunity to go abroad and his experience with the American Expeditionary Forces in France no doubt greatly broadened his knowledge of railroad operation and construction. There has been for many men a fascination about railroad work, second only to that of the army in war time. A railroad man from the time he becomes a division superintendent, deals in an executive capacity with men and situations. On his sound judgment and quickness of decision depend not only important commercial questions but questions of life and death of employees and travelers. Advancement means greater responsibilities and more extended authority. So great is the responsibility of a railroad executive of a large system that it is essential, if American railroads are to maintain the high standard which has been achieved, that not only large money reward but the opportunity to exercise great responsibility and power should attract into the service men of extraordinary ability. Whatever the personal reasons for Mr. McCrea's retirement from railroad service may have been, it is a fitting occasion to consider seriously whether conditions as they have been